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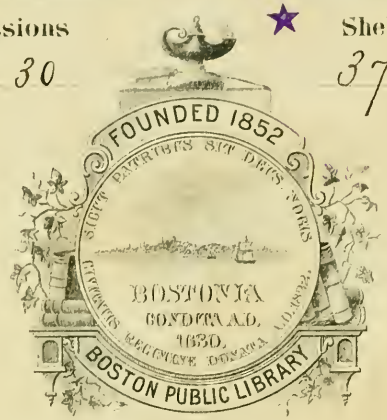

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A

TREATISE

ON THE

Operations of SURGERY,

WITH A

DESCRIPTION and REPRESENTATION

OF THE

INSTRUMENTS

Used in Performing them:

To which is Prefixed an

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INTRODUCTION

ON THE

NATURE and TREATMENT

OF

WOUNDS, ABSCESSES, and ULCERS.

By SAMUEL SHARPE,

Fellow of the Royal Society, and Member of the Academy of Surgery at PARIS.

The NINTH EDITION.

LONDON.

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MDCCLXIX.

Walter Channing M. D.
14030
Mar. 18, 1858

TO

WILLIAM CHESELDEN, Esq.

Surgeon to CHELSEA-HOSPITAL.

SIR,

A

AS I am chiefly indebted to the Advantage of an Education under You, for whatever Knowledge I can pretend to in Surgery, I could not in the leaſt heſitate to whom I ſhould dedicate this Treatiſe; though was it my Misfortune

to be a Stranger to your Perſon, that Merit which has made the World ſo long eſteem You the Ornament of our Profeſſion, would alone have induced me to ſhew You this Mark of my Reſpect, which I hope will not be unacceptable from,

SIR,

Your moſt obedient

humble Servant,

S. SHARPE.

PREFACE.

AS the Methods of operating in Surgery have of late Years been exceedingly improved in *England*, and there is no Treatiſe of Character on that Subject written in our Language, I believe it is not neceſſary to apologize for this Undertaking: It is true, we have a few Tranſlations from the Writings of Foreigners, but beſides that they are unacquainted with theſe Improvements, their manner of deſcribing an Operation is ſo very minute, and in general ſo little pleaſing, that could nothing new be added, or nothing falſe exploded, the Poſſibility

of only doing it more concisely and agreeably would be a reasonable Inducement to the Attempt.

In the Description of Diseases, I have only mentioned their distinguishing Appearances, and have not once dared to guess at that particular Disorder in the Animal Oeconomy, which is the immediate Cause of them; indeed, the Uncertainty there is in Conjectures of this intricate Nature, and the little Service that can accrue to Surgery from such speculative Enquiries, have entirely deterred me from all Pretence to this sort of Theory; and since the most ingenious Men hitherto, have not, by the help of *Hypotheses*, done any considerable Service to the Practice of Surgery, nay, for the most part have misled young Surgeons from the Study of the Symptoms and Cure of Diseases, to an idle turn of Reasoning, and a certain Stile in Conversation,

tion, which has very much discredited the Art amongst Men of Sense; I hope I am right in my Silence on that Head.

It has been very much my Endeavour to make this Treatise short, and therefore I have given no Histories of Cases, but where the uncommonness of the Doctrine made it proper to illustrate it with Fact, and these I have recited in the most concise manner I was able: On this account too, I think I have not attempted to explode any Practice which is already in disrepute, and if it appear otherwise to Men of Skill here in *London*, I beg they will refer to those Books of Surgery which are now the best esteemed in *Europe*, and to which I have almost always had an Eye in the Criticisms I have made on the generality of Opinions.

It is usual with most Writers to describe at length the several Bandages

proper to be employed after each Operation; but as the manner of applying them can hardly be learnt from a Deſcription only, or if it could, there is ſo little to be ſaid on that Subject, but what muſt be copied from others, that I have forborn to follow the Example; though to ſay the Truth, the Purpoſe of Bandage being chiefly to maintain the due Situation of a Dreſſing, or to make a Compreſs on particular Parts, Surgeons always turn a Roller with thoſe Views, as their Diſcretion and Dexterity guide them, without any Regard to the exact Rules laid down in theſe Deſcriptions, which are almoſt impoſſible to be retained in the Memory without a continual Practice of them, and therefore we ſee are not much attended to.

In the firſt Edition of this Treatiſe, I aſſerted (*p.* 99.) that the Hæmorrhage, which ſometimes enſues in the Lateral

Lateral Operation, had been eſteemed an Objection of ſo great Weight, as to have occaſioned its being ſuppreſſed in the Hoſpitals of *France* by a Royal Edict: I have ſince been informed I was miſtaken in that Particular, and that it had only been forbidden in the *Charité* by Monſieur *Marechal* the King's firſt Surgeon, who had the Inſpection of the Practice of Surgery in that Hoſpital: what were his Motives for not ſuffering this Method to be continued there, after having been performed a whole Seaſon, I will not take upon me to determine.

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INTRO-

INTRODUCTION.

CHAP. I.

Of WOUNDS.

TO conceive rightly of the Nature and Treatment of Wounds, under the Variety of Diſorders that they are ſubject to, it will be proper firſt to learn, what are the Appearances in the Progreſs of Healing a large Wound, when it is made with a ſharp Inſtrument, and the Conſtitution is pure.

In this Circumſtance, the Blood-Veſſels, immediately upon their Diviſion, bleed freely, and continue bleeding till they are either ſtopp'd by Art, or at length contracting and withdrawing themſelves into the Wound, their Extremities are ſhut up by the coagulated Blood. The Hæmorrhage being ſtopp'd, the next Occurrence, in about twenty-four Hours, is a thin ſerous Diſcharge, and a Day or two after, an Increaſe of it, tho' ſomewhat thickened, and ſtinking. In this State it continues two or three Days without any

great Alteration, from which Time the Matter grows thicker and leſs offenſive; and when the Bottom of the Wound fills up with little Granulations of Fleſh, it diminiſhes in its Quantity, and continues doing ſo, till the Wound is quite ſkinned over.

The firſt Stage of Healing, or the Diſcharge of Matter, is by Surgeons called *Digeſtion*; the Second, or the filling-up with Fleſh, *Incarnation*; and the laſt, or ſkinning over, *Cicatrization*. Theſe are the Technical Terms chiefly in uſe, and are fully ſufficient to deſcribe the State of Wounds, without the farther Subdiviſions uſually found in Books.

It is worth obſerving, that the Loſs of any particular Part of the Body can only be repaired by the Fluids of that diſtinct Part; as in a broken Bone, the *Callus* is generated from the Ends of the Fracture, ſo, in a Wound, is the Citatrix from the Circumference of the Skin only: Hence ariſes the Neceſſity of keeping the Surface even, either by Preſſure or eating Medicines, that the Eminence of the Fleſh may not reſiſt the Fibres of the Skin in their Tendency to cover the Wound. This Eminence is compoſed of little Points or Granulation called

Fungus,

Fungus, or proud Fleſh, as is frequently eſteemed an Evil, though in Truth, this Species of it be the conſtant Attendant on healing Wounds; for when they are ſmooth, and have no Diſpoſition to ſhoot out above their Lips, there is a Slackneſs to heal, and a Cure is very difficultly effected: Since then a *Fungus* prevents healing only by its Luxuriancy, and all Wounds cicatriſe from their Circumference, there will be no Occaſion to deſtroy the whole *Fungus* every Time it riſes, but only the Edges of it near the Lips of the Skin, which may be done by gentle Eſcharoticks, ſuch as Lint dipt in a mild Solution of *Vitriol*, or for the moſt Part only by dry Lint, and a tight Bandage, which will reduce it ſufficiently to a Level, if applied before the *Fungus* have acquired too much Growth. In large Wounds, the Application of corroſive Medicines to the whole Surface, is of no uſe; becauſe the *Fungus* will attain but to a certain Height when left to itſelf, which it will be frequently riſing up to, though it be often waſted; and as all the Advantage to be gathered from it, is only from the Evenneſs of its Margin, the Purpoſe will be as fully anſwered by keeping that under only, and an infinite deal of Pain

avoided from the continual Repetition of Eſcharoticks.

When I ſpeak of the Neceſſity of a Wound being repaired by the ſame Fluids of which the Part was before compoſed, I mean, upon the Suppoſition, that the Renewal be of the ſame Subſtance with the Part injured; as Callus is of Bone, and a Cicatrix is of Skin; for a Vacuity is generally filled up with one Species only of Fleſh, though it poſſeſs the Space, in which were included before the Wound was made, the diſtinct ſeparate Subſtances of *Membrana Adipoſa*, *Membrana Muſculorum*, and *the Muſcle itſelf*; and even if we ſcratch or perforate a Bone, there are certain wounded Veſſels in it that puſh out Fleſh which becomes the Covering of it; and after Fractures of the Skull, when the Surface of the Brain is hurt, and Part of the Membranes and Bones removed, the whole Cavity is filled up by nearly the ſame uniform Subſtance, till it arrive even with the Skin, which ſpreads over it to complete the Cure.

On this account it is, that after the healing of Wounds, where the Surface of the Bone has been bare, the Citatrix is always adherent to it, and no abſolute Diſtinction of

of Parts preſerved; though if a Wound be made of any certain Magnitude, the Adherence, after healing, will not be ſo wide as the Wound itſelf was, but only of the Extent of the Cicatrix, which is always much ſmaller than the Inciſion; becauſe Healing does not conſiſt only in the forming of new Matter, but alſo in the Elongation of the Fibres of the circumjacent Skin and Fleſh towards the Center of the Wound; which will cover it in more or leſs Time, and in greater or leſs Quantity, in proportion to their Laxneſs; for the Scar does not begin to form, till they reſiſt any farther Extenſion; hence ariſes the Advantage in Amputations, of ſaving a great deal of Skin.

From what has been ſaid of the Progreſs of a Wound made by a ſharp Inſtrument, where there is no Indiſpoſition of Body, we ſee the Cure is performed without any Interruption but from the *Fungus*; ſo that the Buſineſs of Surgery will conſiſt principally in a proper Regard to that Point, and in Applications that will the leaſt interfere with the ordinary Courſe of Nature, which in theſe Caſes, will be ſuch as act the leaſt upon the Surface of the Wound; and agreeably to this we find, that dry Lint only

is generally the beſt Remedy through the whole Courſe of Dreſſing: at firſt, it ſtops the Blood with leſs Injury than any ſtyptick Powders or Waters, and afterwards, by abſorbing the Matter, which in the Beginning of Suppuration is thin, and acrimonious, it becomes in effect a Digeſtive: During Incarnation it is the ſofteſt Medium that can be applied between the Roller and tender Granulations, and at the ſame Time, is an eaſy Compreſs upon the ſprouting *Fungus*.

Over the dry Lint, may be applied a Pledgit of ſome ſoft Ointment ſpread upon Tow, which muſt be renewed every Day, and preſerved in its Situation by a gentle Bandage; though in all large Wounds, the firſt Dreſſing after that of the Accident or Operation, ſhould not be applied in leſs than three Days, when the Matter being formed, the Lint ſeparates more eaſily from the Part; in the Removal of which, no Force ſhould be uſed, but only ſo much be taken away as is looſe, and comes off without Pain.

Perhaps it may appear ſurpriſing that I do not recommend either digeſtive or incarnative Ointments, which have had ſuch Reputation formerly for their Efficacy in all Species of Wounds; but as the Intent of Medicines is to reduce the Wound to a natural State,

State, or a Propenſity to heal, which is what I have already ſuppoſed it to be in; the End of ſuch Applications is not wanted, and in other reſpects dry Lint is more advantageous, as may be learnt from what I have ſaid of its Benefits. There are certainly many Caſes in which different Applications will have their ſeveral Uſes; but theſe are when Wounds are attended with a Variety of Circumſtances not ſuppoſed in that I have been ſpeaking of; though even when theſe, by the Virtue of Medicines, are reduced to as kind a State, the Method of treating them afterwards ſhould be the ſame, as will be better underſtood by the next Chapter, in which I ſhall treat more particular of the Dreſſing of Wounds.

CHAP. II.

Of Inflammations and Abſceſſes.

AS almoſt all Abſceſſes are the Conſequences of Inflammations, and theſe produce a Variety of Events, as they are differently complicated with other Diſorders, it will be proper firſt to make ſome Inquiry into their Diſpoſition. Inflammations from all Cauſes have three ways of

terminating; either by Diſperſion, Suppuration, or Gangrene; a Schirrhous Gland is always mentioned as a fourth, but I think with Impropriety, ſince it ſeldom or never occurs, but in venereal, ſcrophulous, or cancerous Caſes, when it is the Forerunner, and not the Conſequence of an Inflammation, the Tumour generally appearing ſome Time before the Diſcolouration.

But though every kind of Inflammation will ſometimes terminate in different Shapes, yet a probable Conjecture of the Event, may be always gathered from the State of the Patient's Health. Thus Inflammations happening in a ſlight Degree upon Colds, and without any foregoing Indiſpoſition, will moſt probably be diſperſed: Thoſe which follow cloſe upon a Fever, or happen to a very groſs Habit of Body, will generally impoſthumate: and thoſe which fall upon very old People, or dropſical Conſtitutions, will have a ſtrong Tendency to gangrene.

If the State of an Inflammation be ſuch, as to make the Diſperſion of it ſafely practicable, that End will be beſt brought about by Evacuations, ſuch as plentiful Bleeding and repeated Purges: the Part itſelf muſt

be treated with Fomentations twice a Day: and if the Skin be very tenſe, it may be embrocated with a Mixture of three Fourths of Oil of Roſes, and one Fourth of common Vinegar, and afterwards be covered with *Unguent. Flor. Samb.* or a ſoft Ointment made of white Wax and ſweet Oil, ſpread upon a fine Rag, and roll'd on gently. I know that almoſt all Surgeons are averſe to the Application of any Thing unctuous to an inflamed Skin, upon the Suppoſition of its obſtructing the Pores, and by that Means preventing the Tranſpiration of the obſtructed Fluids, which is imagined to be one of the Ways that an Inflammation is removed; but whether this Reaſoning be founded on Practice or Theory only, I am not clear; though I think it very certain, that Inflammations left to themſelves, often grow ſtiff and painful, and are to be eaſed by any Medicine that makes them more ſoft and pliable; which ſhould not incline us to believe, that relaxing Medicines interrupted the Diſpoſition to a Cure: However, to preſerve ſome ſort of Medium, in Inflammations of the Face, where they are eſteemed moſt dangerous, it may be made a Rule to uſe nothing more oily than warm Milk, with which

which the Face may be embrocated five or ſix Times a Day. If after four or five Days, the Inflammation begin to ſubſide, the Purging-Waters and Manna may take Place of other Purges, and the Embrocation of Oil and Vinegar be now omitted, or ſooner, if it has begun to excoriate. The Ointment of Wax and Oil may be continued to the laſt: or if upon Concluſion of the Cure, the Itching of the Skin ſhould be troubleſome, it may better relieved by the Application of Nutritum, which is an Ointment made of equal Parts of Diachylon and ſweet Oil, melted ſoftly down, and afterwards ſtirred together with a little Addition of Vinegar till they are cold. During the Cure, a thin Diet is abſolutely neceſſary, and in the Height of the Inflammation, the drinking of thin Liquors is of great Service.

Here I have ſuppoſed that the Inflammation had ſo great a Tendency to Diſcuſſion, as by the Help of proper Aſſiſtance to terminate in that Manner; but when it happens that the Diſpoſition of the Tumour reſiſts all diſcutient Means, we muſt then deſiſt from any farther Evacuations, and, as much as we can, aſſiſt Nature in the bringing on a Suppuration.

That

That Matter will moſtly likely be formed, we may judge from the Increaſe of the ſymptomatick Fever, and Enlargement of the Tumour, with more Pain and Pulſation; and if a ſmall Rigor come on, it is hardly to be doubted: Inflammations after a Fever, and the Small-Pox, almoſt always ſuppurate; but theſe preſently diſcover their Tendency, or at leaſt ſhould be at firſt gently treated, as though we expected an Impoſthumation. It is a Maxim laid down in Surgery, that Evacuations are pernicious in every Circumſtance of a Diſeaſe, which is at laſt to end in Suppuration: But as Phyſicians do now acknowledge, that Bleeding on certain Occaſions in the Small-Pox, is not only no Impediment to the Maturation, but even promotes it; ſo in the Formation of Abſceſſes, when the Veſſels have been clogged, and the Suppuration has not kindly advanced, Bleeding has ſometimes quickened it exceedingly; but however this Practice is to be followed with Caution. Purges are, no doubt, improper at this Time; yet if the Patient be coſtive, he muſt be aſſiſted with gentle Clyſters every two or three Days.

Of all the Applications invented to promote

mote Suppuration, there are none ſo eaſy as Pultices; but as there are particular Tumours very ſlow of Suppuration, and almoſt void of Pain (ſuch, for Inſtance, are ſome of the ſcrophulous Swellings) it will be leſs troubleſome in theſe Caſes to wear the Gum-Plaiſters, which may be renewed every four or five Days only. Amongſt the ſuppurative Pultices, perhaps there is none preferable to that made of Bread and Milk ſoftened with Oil; at leaſt, the Advantage of any other over it, is not to be diſtinguiſhed in Practice. The Uſe of ſuppurative Plaiſters in haſty Abſceſſes, or Inflammations in a weak or dropſical Habit of Body, is by no Means adviſeable, as they are apt to ſit uneaſy on the Inflammation, are often painful to remove, when we enquire into the State of the Tumour, and by their Compreſs, in bad Conſtitutions add ſomething to the Diſpoſition of the Part to mortify. The Abſceſs may be covered with the Pultice twice a-day, till it be come to that Ripeneſs as to require opening, which will be known by the Thinneſs and Eminence of the Skin in ſome Part of it, a Fluctuation of the Matter, and generally ſpeaking an Abatement of the Pain previous to theſe Appearances. The Manner

Manner of opening an Abſceſs I ſhall deſcribe, after having ſpoken of a Gangrene, which is the other Conſequence of an Inflammation.

The Signs of a Gangrene are theſe: the Inflammation loſes its Redneſs, and becomes duſkiſh and livid; the Tenſeneſs of the Skin goes off, and feels to the Touch, flabby or emphyſematous; Veſications filled with Ichor of different Colours ſpread all over it; the Tumour ſubſides, and from a duſkiſh Complexion, turns black; the Pulſe quickens and ſinks, and profuſe Sweats coming on, at laſt grow cold, and the Patient dies.

To ſtop the Progreſs of a Mortification, the Method of Treatment will be nearly the ſame, from whatever Cauſe it proceed, except in that ariſing from Cold; in which Caſe we ought to be cautious not to apply Warmth too ſuddenly to the Part, if it be true, that in the Northern Countries they have daily Conviction of Gangrenes produced by this Means, which might have been eaſily prevented by avoiding Heat; nay, they carry their Apprehenſion of the Danger of ſudden Warmth ſo far, as to cover the Part with Snow firſt, which they ſay, ſeldom fails to obviate any ill Conſequence.

The

The Practice of scarifying Gangrenes, by several Incisions, is almost universal, and, I think, with Reason, since it not only sets the Parts free, and discharges pernicious Ichor, but makes way for whatever Efficacy there may be in topical Applications. These are different with different Surgeons, but I believe the Digestives softened with Oil of Turpentine are as good Dressings as any for the Scarifications; and upon them, all over the Part, may be laid the *Theriaca Londinensis*, which should be always used in the Beginning of a Gangrene, before the Necessity of scarifying arises; or what is equally good, if not often preferable, a Cataplasm made with Lixivium and Bran, and applied warm, which will retain its Heat better than most other Topicals. There are some who insist upon having had particular Success in the stopping of Gangrenes, from the Use of the Grounds of strong Beer mixed with Bread or Oatmeal; but there are hardly any Facts less proper to infer from, than the ceasing of a Mortification, since we see amongst the Poor that are brought into the Hospitals, how often it happens without any Assistance; however, it is certain, that Service may be done by spirituous Fomentations,

tions, and the Dreſſings above-mentioned, which are to be repeated twice a-day: Medicines alſo given internally are beneficial, and theſe ſhould conſiſt of the Cordial kind, though at preſent the Bark is ordered by a great many Surgeons as the ſovereign Remedy for this Diſorder: After the Separation of the Eſchar, the Wound becomes a common Ulcer, and muſt be treated as ſuch.

There are two ways of opening an Abſceſs: either by Inciſion or Cauſtick: but Inciſion is preferable in moſt Caſes. In ſmall Abſceſſes, there is ſeldom a Neceſſity for greater Dilatation than a little Orifice made with the Point of a Lancet; and in large ones, where there is not a great Quantity of Skin diſcoloured and become thin, an Inciſion to their utmoſt Extent, will uſually anſwer the Purpoſe; or if there be much thin diſcoloured Skin, a circular or oval Piece of it muſt be cut away; which Operation, if done dexterouſly with a Knife, is much leſs painful than by Cauſtick, and at once lays open a great Space of the Abſceſs, which may be dreſſed down to the Bottom, and the Matter of it be freely diſcharged; whereas after a Cauſtick, tho' we make Inciſions through the Eſchar, as is the uſual

Practice,

Practice, yet the Matter will be under some Confinement, and we cannot have the Advantage of dressing properly, till the Separation of the Slough, which often requires a considerable Time, so that the Cure must be necessarily delayed, besides, that the Pain of burning, continuing two or three Hours, which a Caustick usually requires in doing its Office, draws such a Fluxion upon the Skin round the Eschar, as sometimes to indispose it very much for healing afterwards. In the Use of Caustick, it is but too much a Practice, to lay a small one on the most prominent Part of a large Tumour, which not giving sufficient Vent to the Matter, and perhaps the Orifice soon after growing narrow, leads on to the Necessity of employing Tents: which two Circumstances more frequently make Fistulas after an Abscess, than any Malignity in the Nature of the Abscess itself. The Event would more certainly be the same after a small Incision; but I observe, that Surgeons not depending so much on small Openings by Incision, as by Caustick, do, when they use the Knife, generally dilate sufficiently: whereas in the other way, a little Opening in the most depending Part of the Tumour usually satisfies

fies them: but as the Method of making ſmall Orifices for great Diſcharges, is for the moſt part tedious of Cure, very often requiring Dilatation at laſt, and now and then pernicious in the Conſequence above-mentioned, and even making the adjacent Bones carious, I thought it might not be uſeleſs to caution againſt this Practice.

Here it may not be amiſs to obſerve, that notwithſtanding the depending Part of an Abſceſs is eſteemed the moſt eligible for an Opening, yet it is always on the Suppoſition that the Teguments are as thin in that Place as any other Part of it; otherwiſe it will be generally adviſeable to make the Inciſion where Nature indicates, that is, where the Tumour is inflamed and prominent, though it ſhould not be in a depending Part.

The indiſcriminate Application of Cauſticks to all Abſceſſes, often runs into the ſame Miſchief of Tedioufneſs in the Cure, from a Cauſe exactly the Reverſe of that I have been deſcribing; for as in great Swellings they are ſeldom laid on large enough, and the Matter continues draining for want of a ſufficient Opening; ſo in ſmall ones, they make a greater Opening than is neceſſary, and therefore demand a greater Length of Time to repair the Wound. I confeſs the

Diſpoſition of Abſceſſes to fill up, after the Diſcharge of Matter, is ſo very different, that ſome few large ones do well after the mere Puncture of a Lancet, if the Orifice be made in a depending Part, and a proper Bandage can be applied; tho' if ever we truſt to ſuch an opening, it ſhould be in Abſceſſes about the Face, where we ſhould be more careful to avoid the Deformity of a Scar than in any other Part, and where alſo the Method will be more likely to ſucceed, from their Situation; it being a Maxim in Surgery, that Abſceſſes and Ulcers will have a greater or leſs Tendency to heal, as they are higher or lower in the Body; however, even in Abſceſſes of the Face, if the Skin be very thin, it will be always ſafer to open the length of it, than truſt to a Puncture only.

From this Account of the Method of opening Abſceſſes, it does not appear often neceſſary to apply Cauſticks; yet they have their advantages in ſome reſpects, and are ſeldom ſo terrible to Patients as the Knife, tho' in fact they are frequently more painful to bear; they are of moſt uſe in Caſes where the Skin is thin and inflamed, and we have reaſon to think the Malignity of the Abſceſs is of that Nature as to prevent a quickneſs of Incarning, in which Circumſtance, if an Inciſion

Inciſion only were made thro' the Skin, little Sinuſes would often form, and burrow underneath, and the Lips of it lying looſe and flabby, would become callous, and retard the Cure, tho' the Malignity of the Wound were corrected: of this kind, are Venereal Bubos, which notwithſtanding they often do well by mere Inciſion, yet when the Skin is in the State I have ſuppoſed, the Cauſtick is always preferable, as I have had many Opportunities of being convinced. It is to be obſerved, I confine this Method to Venereal Bubos; for thoſe which follow a Fever, or the Small-pox, for the moſt part are curable by Inciſion only. There are many ſcrophulous Tumours, where the Reaſoning is the ſame as in the Venereal; and even in great Swellings where I have recommended Inciſion, if the Patient will not ſubmit to Cutting, and the Surgeon is apprehenſive of any Danger in wounding a large Veſſel, which is often done with the Knife, (tho' it may readily be taken up with the Needle and Ligature) yet as this inconvenience is avoided by Cauſtic, it may on ſuch an Occaſion be made uſe of; but I think after the Eſchar is made, it ſhould be cut almoſt all away, which will be no Pain to the Patient, and will give a much freer Diſcharge to the Matter than In-

ciſions made thro' it: however, in ſcrophulous Swellings of the Neck and Face, unleſs they are very large, Cauſticks are not adviſeable, ſince in that Part of the Body, with Length of Time, they heal after Inciſion. Cauſticks are of great Service in deſtroying ſtubborn ſcrophulous Indurations of the Glands, alſo venereal Indurations of the Glands of the Groin, which will neither diſcuſs nor ſuppurate; likewiſe in expoſing carious Bones, and making large Iſſues. The beſt Cauſtick in uſe is a Paſte made with Lime and *Lixivium Capitale*, which is to be prevented from ſpreading, by cutting an Orifice in a Piece of ſticking Plaiſter, nearly as big as you mean to make the Eſchar, which being applied to the Part, the Cauſtick muſt be laid on the Orifice and preſerved in its Situation, by a few Slips of Plaiſter laid round its Edges, and a large Piece over the whole. When Iſſues are made, or Bones expoſed, the Eſchar ſhould be cut out immediately, or the next Day; for if we wait the Separation, we miſcarry in our Deſign of making a deep Opening; ſince Sloughs are flung off by the ſprouting new Fleſh underneath, which fills up the Cavity at the ſame time that it diſcharges the Eſchar; ſo that we are obliged afterwards to make the opening a ſecond Time

Time with painful eſcharotick Medicines. To make an Iſſue, or lay a Bone bare, this Cauſtick may lie on about four Hours; to deſtroy a large Gland, five or ſix; and to open Abſceſſes, an Hour and a half, two Hours, or three Hours, according to the Thickneſs of the Skin; and what is very remarkable, notwithſtanding its Strength and ſudden Efficacy, it frequently gives no Pain where the Skin is not inflamed, as in making Iſſues, and opening ſome few Abſceſſes.

Hitherto I have ſuppoſed the Surgeon has had the opportunity of opening the Tumour at the moſt eligible Time, that is, when the Skin is thin, and the Fluctuation of the Matter very ſenſible; which is always to be waited for, notwithſtanding it be very much taught, to open critical Abſceſſes before they come to an exact Suppuration, in order to give Vent ſooner to the noxious Matter of the Diſeaſe; but in opening before this Period, Practitioners miſs the very Deſign they aim at; ſince but little Matter is depoſited in the Abſceſs before it arrives towards its Ripeneſs, and beſides, the Ulcer afterwards grows foul, and is leſs diſpoſed to heal.

When an Abſceſs is already burſt, we are to be guided by the Probe where to dilate, obſerving the ſame Rules with regard to the

Degree of Dilatation, as in the other Caſe; the uſual Method of dilating, is with the Probe-ſciſſars, and indeed, in all Abſceſſes, the generality of Surgeons uſe the Sciſſars, after having firſt made a Puncture with a Lancet; but as the Knife operates much more quickly, and with leſs Violence to the Parts, than Sciſſars, which ſqueeze at the ſame time that they wound, 'twill be ſparing the Patient a great deal of Pain to uſe the Knife, where-ever it is practicable, which is in almoſt all Caſes, except ſome *Fiſtulas in Ano*, where the Sciſſars are more convenient. The manner of opening with a Knife, is by ſliding it on a Director, the Groove of which prevents its being miſguided. If the Orifice of the Abſceſs be ſo ſmall as not to admit the Director, or the Blade of the Sciſſars, it muſt be enlarged by a Piece of Sponge-tent, which is made by dipping a dry Bit of Sponge in melted Wax, and immediately ſqueezing as much out of it again as poſſible, between two Pieces of Tile or Marble; the Effect of which is, that the looſe Sponge being compreſſed into a ſmall Compaſs, if any of it be introduced into an Abſceſs, the Heat of the Part melts down the remaining Wax that holds it together, and the Sponge ſucking up the Moiſture of the Abſceſs, expands,

pands, and in expanding, opens the Orifice wider, and by degrees, ſo as to give very little Pain.

The uſual Method of dreſſing an Abſceſs, the firſt time, is with dry Lint only, or if there be no Flux of Blood, with ſoft Digeſtives ſpread on Lint. If there be no Danger of the upper Part of the Wound reuniting too ſoon, the Doſſils muſt be laid in looſe; but if the Abſceſs be deep, and the Wound narrow, as is the Caſe ſometimes of Abſceſſes *in Ano*, the Lint muſt be crammed in pretty tightly, that we may have afterwards the Advantage of dreſſing down to the bottom without the uſe of Tents, which are almoſt univerſally decried in theſe Days, though they ſtill continue to be employed too much by the very People, who would ſeem to explode them moſt; ſo difficult is it to be convinced of the true Efficacy of Nature in the healing of Wounds. Formerly, the Virtues of Tents have been much inſiſted on, as it was then thought abſolutely neceſſary to keep Wounds open a conſiderable time, to give Vent to the imaginary Poiſon of the Conſtitution; it was ſuppoſed too, that they were beneficial, in conveying the proper ſuppurative or ſarcotick Medicines down to the Bottom of the Abſceſs; and again, that by abſorbing the

Matter, they preſerved the Cleanlineſs of the Wound, and diſpoſed it to heal. But this Reaſoning is not now eſteemed of any force; Surgeons at preſent know that a Wound cannot heal too faſt, provided that it heal firmly from the Bottom; they are very well ſatisfied alſo from what they ſee in Wounds, where no Medicines are applied, that Nature of herſelf ſhoots forth new Fleſh, and is interrupted by any Preſſure whatſoever; beſides, as to the Conceit of Tents ſucking up the Matter, which is eſteemed noxious to healing, they are ſo far from being beneficial in the Performance of it, that they are of great Prejudice; for if the Matter be offenſive in its Nature, tho' they do abſorb it, they bring it into Contact with every Part of the Sinus; and if it be prejudicial by its Quantity, they do Miſchief in locking it up in the Abſceſs, and preventing the Diſcharge it would find, if the Dreſſings we only ſuperficial; but in fact, Matter when it is good, is of no Diſſervice to Wounds with regard to its Quality; and Surgeons ſhould therefore be leſs curious in wiping them clean, when they are tender and painful. That Tents are Impediments to Healing rather than Aſſiſtants, we may learn from conſidering the Effect of a Pea in an Iſſue, which by

Preſſure

Preſſure keeps open the wound juſts as Tents do; and if there are Inſtances of Wounds healing very well notwithſtanding the uſe of Tenets, ſo there are alſo of Iſſues healing up, in ſpite of any Meaſures we can take to keep a Pea in its Cavity. In ſhort, Tents in Wounds, by reſiſting the Growth of the little Granulations of Fleſh, in proceſs of Time harden them, and in that manner produce a Fiſtula; ſo that inſtead of being uſed for the Cure of an Abſceſs, they never ſhould be employed but where we mean to retard the Healing of the external Wound, except in ſome little narrow Abſceſſes, where if they be not crammed in too large, they become as Doſſils, admitting of Incarnation at the Bottom; but Care ſhould be taken, not to inſinuate them much deeper than the Skin in this Caſe, and that they ſhould be repeated twice a-day, to give Vent to the Matter they confine. Sometimes they are of Service in large Abſceſſes, particularly of the Breaſt, where the Matter cannot diſcharge itſelf by the Orifice already made, and yet does not point ſufficiently to any other Part for an Opening, tho' it make Signs whither it would tend, if it were a little confined. In ſuch an Inſtance, a Tent plugging up the Orifice, would make the Matter recur to the

Part

Part disposed to receive it, and mark the Place for a Counter-opening: but Tents do most good in little deep Abscesses, whence any extraneous Body is to be evacuated, such as small Splinters of Bone, *&c.*

The Use of Vulnerary Injections into Abscesses has been thought to bear so near a Resemblance to the Use of Tents, that they both fell into Disrepute almost at the same Time. It has been said in their Favour, that in deep Abscesses where no Ointment can be applied, they digest, cleanse, and correct the Malignity of the *Pus*; but the Fact is, that they do so much Mischief by frequently distending the Parts of the Abscess, first, when they are injected, and afterwards, by their Addition to the Matter generated in the Abscess, that they are hardly proper in any Case: though one of the great Mischiefs of Injections and Tents both, has been a mistaken Faith amongst Practitioners, that where-ever their Medicines were applied, the Part would heal; and upon that Presumption, they have neglected to dilate Abscesses, which have not only remained incurable after this Treatment, but would often have done so for want of a Discharge, if they had been dressed more superficially.

In

In dreſſing Wounds, it is common to apply the Medicines warm, or hot, upon the Suppoſition that heated Ointments have a ſtronger Power of digeſting, than cold; but as any Medicines will ſoon arrive to the Heat of the Part it is laid on, whether it be applied hot or cold, the Efficacy of the Heat can avail but little in ſo ſmall a Time; and as Doſſils dipt in hot Ointments are not cleanly, and even grow ſtiff and painful, beſides that the Patient is liable to be burnt by laying on too hot, I think it rather preferable to apply them cold, or perhaps in Winter a little warmed before the Fire after they are ſpread; obſerving, if the Ulcer be uneven, to make the Doſſils ſmall in order to lie cloſe. Over the Doſſils of Lint may be laid a large Pledgit of Tow ſpread with Baſilicon, which will lie ſofter than a defenſative Plaiſter; for this, though deſigned to defend the Circumference of Wounds againſt Inflammation or a Fluxion of Humours, is often the very Cauſe of them; ſo that the Dreſſings of large Wounds ſhould never be kept on by theſe Plaiſters, where there is Danger of ſuch Accidents; and it is on the account of the Unfitneſs of Plaiſters of any kind for an Inflammation, that I have omitted to mention any of them as proper Diſcutients

cutients in that Diſorder. In this manner, the Dreſſings may be continued, till the Cavity is incarned, and then it may be cicatriſed with dry Lint, or ſome of the cicatriſing Ointments, obſerving to keep the *Fungus* down, as directed before: If the Drying-ointment be the *Cerat. de Lapid. Calam.* the Stone muſt be thoroughly levigated before it be put into it, otherwiſe the Ointment will be corroſive.

In the Courſe of Dreſſing it will be proper to have regard to the Situation of the Abſceſs, and as much as poſſible to make the Patient favour the Diſcharge by his ordinary Poſture; and to this end alſo, as what is of greater Importance than the Virtue of any Ointment, the Diſcharge muſt be aſſiſted by Compreſs and Bandage, the Compreſs may be made of Rags or Plaiſter; though the latter is ſometimes preferable, as it remains immoveable on the Part it is applied to. The Frequency of Dreſſing will depend on the Quantity of Diſcharge; once in twenty-four Hours is ordinarily ſufficient; but ſometimes twice, or perhaps three times, is neceſſary. I have before mentioned, not to be too ſcrupulouſly nice in cleaning a Wound; but it is worth remarking, that a Sore ſhould never be wiped by drawing a Piece of Tow

or

or Rag over it, but only by dabbing it with fine Lint, which is a much eaſier Method for the Patient: the Parts about it may be wiped clean in a rougher Manner, without any Prejudice. I do not think the Air has that ill Effect on Sores as is generally conceived; nor would the large Abſceſſes on Beaſts, which are often expoſed to the Air the whole Time of Cure, do well, if it were ſo very pernicious as is repreſented; but as it tends to the making a Scab, and in Winter is a little painful to the new Fleſh, it will be right to finiſh the Dreſſing as quick as may be without hurrying. Another Caution neceſſary in the Treatment of Abſceſſes, is, That Surgeons ſhould not upon all Occaſions ſearch into their Cavities with the Finger or Probe, as it often tears them open and indiſpoſes them for a Cure.

CHAP. III.

Of *ULCERS.*

WHEN a Wound or Abſceſs degenerates into ſo bad a State as to reſiſt the Methods of Cure I have hitherto laid down, and loſes that Complexion which belongs to a healing Wound, it is called an Ulcer; and as the Name is generally borrowed from the ill

ill Habit of the Sore, it is a Cuſtom to apply it to all Sores that have any Degree of Malignity, tho' they be immediatly formed without any previous Abſceſs or Wound; ſuch are the Venereal Ulcers of the Tonſils, *&c.*

Ulcers are diſtinguiſhed by their particular Diſorders, tho' it ſeldom happens that the Affections are not complicated; and when we lay down Rules for the Management of one Species of Ulcer, it is generally requiſite to apply them to almoſt all others. However, the Characters of moſt eminence are, the callous Ulcer, the ſinuous Ulcer, and the Ulcer with Caries of the adjacent Bone; tho' there be abundance more known to Surgeons, ſuch as the Putrid, the Corroſive, the Varicous, *&c.* but as they have all acquired their Names from ſome particular Affection, I ſhall ſpeak of the Treatment of them under the general Head of Ulcers.

It will be often in vain to purſue the beſt Means of Cure by Topical Application, unleſs we are aſſiſted by internal Remedies; for as many Ulcers are the Effects of a particular Indiſpoſition of Body, it will be difficult to bring them into Order, while the Cauſe of them remains with any Violence; tho' they are ſometimes in a great Degree the

Inflamed ulcer. Do with a varicose Diſcharge
state of the veins, with oedema of the limb, indolent Do
with peculiar action of the system, fungous,

Diſcharge of the Indiſpoſition itſelf, as in the Plague, Small-pox, &c. But we ſee it generally neceſſary in the Pox, the Scurvy, Obſtructions of the Menſes, Dropſies, and many other Diſtempers, to give Internals of great Efficacy; and indeed, there are hardly any Conſtitutions, where Ulcers are not aſſiſted by ſome phyſical Regimen. Thoſe that are cancerous and ſcrophulous ſeem to gain the leaſt Advantage from Phyſic; for if in their Beginnings they have ſometimes been very much relieved, or cured by Salivation, or any other Evacuation, they are alſo often irritated, and made worſe by them; ſo that there is nothing very certain in the Effects of violent Medicines in theſe Diſtempers. I have ſeen alſo great Quantities of Alteratives tried on a variety of Subjects; but I cannot ſay with extraordinary Succeſs: Upon the whole, I think in both theſe Caſes, the Milk-diet and gentle Purging with Manna, and the Waters, ſeem to be moſt efficacious; tho' briſk Methods may be uſed with more Safety in the Evil than the Cancer; and ſometimes, particularly in young Subjects, the Decoction of the Woods is extremely beneficial for ſcrophulous Ulcers: but it has lately been atteſted by Men of great Skill and Veracity, that Sea-water is more powerful than

than any other Remedy hitherto known, both for ſcrophulous Ulcers, and ſcrophulous Tumours.

When an Ulcer becomes foul, and diſcharges a naſty thin Ichor, the Edges of it, in proceſs of Time, tuck in, and growing ſkinned and hard, give it the name of a callous Ulcer, which, ſo long as the Edges continue in that State, muſt neceſſarily be prevented from healing: but we are not immediately to deſtroy the Lips of it, in expectation of a ſudden Cure; for while the Malignity of the Ulcer remains, which was the Occaſion of the Calloſity, ſo long will the new Lips be ſubject to a Relapſe of the ſame kind, however often the external Surface of them be deſtroyed; ſo that when we have to deal with this Circumſtance, we are to endeavour to bring the Body of the Ulcer into a Diſpoſition to recover by other Methods. It ſometimes happens to poor laborious People, who have not been able to afford themſelves Reſt, that lying a-bed will in a ſhort Time give a Diverſion to the Humours of the Part, and the callous Edges ſoftening, will without any great Aſſiſtance ſhoot out a Cicatrix, when the Ulcer is grown clean and filled with good Fleſh. The Effect of a Salivation is generally the ſame; and even an

Iſſue

Iſſue does ſometimes diſpoſe a neighbouring Ulcer to heal: but though Calloſities be frequently ſoftened by theſe means, yet when the Surface of the Ulcer begins to yield thick Matter, and little Granulations of red Fleſh ſhoot up, it will be proper to quicken Nature by deſtroying the Edges of it, if they remain hard. The manner of doing this, is by touching them a few Days with the Lunar Cauſtick, or *Lapis infernalis*, and ſome chooſe to cut them off with a Knife; but this laſt Method is very painful, and not, as I can perceive, more efficacious; tho' when the Lips do not tuck down cloſe to the Ulcer, but hang looſe over it, as in ſome venereal Bubos where the Matter lies a great way under the Edges of the Skin, the eaſieſt Method is cutting them off with the Sciſſars.

To digeſt the Ulcer, or to procure good Matter from it when in a putrid State, there are an Infinity of Ointments invented; but the *Baſilicon flavum* alone, or ſoftened down ſometimes with Turpentine, and ſometimes mixt up with different Proportions of red Precipitate, ſeems to ſerve the Purpoſes of bringing an Ulcer on to Cicatriſation, as well as any of the others. When the Ulcer is incarned, the Cure may be finiſhed as in other

Wounds; or if it do not cicatriſe kindly, it may be waſhed with *Aq. Calcis*, or *Aq. Phag.* or dreſſed with a Pledgit dipt in *Tinct. Myrrhæ:* and if Excoriations are ſpread round the Ulcer, they may be anointed with *Sperm. Cet.* Ointment, or *Unguent. Nutritum.*

The *red Precipitate* has of late Years acquired the Credit it deſerves for the Cure of Ulcers, but by falling into general Uſe is often very unſkilfully applied: when mixed with the *Baſilicon*, or what is neater, a Cerate of Wax and Oil, it is moſt certainly a Digeſtive, ſince it hardly ever fails to make the Ulcer yield a thick Matter in twenty-four Hours, which diſcharged a thin one before the Application of it. As greater Proportions of it are added to the Cerate, it approaches to an Eſcharotick; but while it is mixed with any Ointment, it is much leſs painful and corroſive, than when ſprinkled on a Sore in Powder; tho' in this Form it is almoſt univerſally employed, but I think injudiciouſly; for as it is a ſtrong Eſcharotick, much of it can never be uſed without making a Slough, and therefore continually repeating it Day after Day, will be making a Succeſſion of Sloughs; or if it be ſprinkled on a Slough already formed, in order to quicken

quicken the Separation of it, ſo much of the Powder as lies on the dead Surface, will be of no Force, and the reſt that lies at the Bottom, and about it, will produce other Sloughs there, by keeping under and deſtroying the little Granulations of Fleſh which in their Growth would elevate and puſh off the firſt Slough, ſo that it cannot be a proper Remedy in this Caſe. If it be anſwered, that daily Practice ſhould convince us that *Precipitate* has not this ill Effect, ſince we ſee Sloughs continually ſeparating, notwithſtanding the Uſe of it; the ſame ſort of Argument may be uſed in favour of any bad Practice, ſince Nature often ſurmounts the greateſt Obſtacles to a Cure: But whoever will attend carefully, without any Prejudice from this Reaſoning, to the two Methods of promoting the Separation of an Eſchar, will find it not only more eaſily, but alſo more readily effected by ſoft Digeſtives, or the *Precipitate* Medicine, than by a great Quantity of the Powder.

If the Ulcer ſhould be of ſuch a Nature as to produce a ſpongy Fleſh, ſprouting very high above the Surface, it will be neceſſary to deſtroy it by ſome of the Eſcharoticks, or the Knife. This *Fungus* differs very much from that belonging to healing

Wounds, being more eminent and lax, and generally in one Mass; whereas the other, is in little distinct Protuberances. It approaches often towards a cancerous Complexion, and when it rises upon some Glands does actually degenerate sometimes into a Cancer, as has happened in Bubos of the Groin. When these Excrescences have arisen in venereal Ulcers, I have pared them with a Knife; but the Flux of Blood is ordinarily so great, that I do not recommend the Method, and rather prefer the Escharoticks. Those in use are the *Vitriol*, the *Lunar Caustick*, the *Lapis Infernalis*, and more generally the red *Precipitate* Powder; but even in this Case, I do not think that Powder the best Remedy; for tho' I have said it is always an Escharotick, yet the *Pulv. Angel.* which is a Composition of the *Precipitate* Powder and burnt Allum, eats deeper, and I think is preferable to the *Precipitate* alone.

It is but seldom, that these inveterate *Funguses* appear on an Ulcer; but it is very usual for those of a milder Kind to rise, which may often be made to subside with Pressure, and the use of mild Escharoticks; however, if the Aspect of the Sore be white and smooth, as happens in Ulcers accompanied with a Dropsy, and often in young Women

Women with Obſtructions, it will anſwer no Purpoſe to waſte the Excreſcencies, 'till the Conſtitution is repaired, when moſt probably they will ſink without any Aſſiſtance. In Ulcers alſo, where the ſubjacent Bone is carious, great Quantities of looſe flabby Fleſh will grow up above the Level of the Skin; but as the Caries is the Cauſe of the Diſorder, it will be in vain to expect a Cure of the Excreſcence, 'till the rotten Part of the Bone be removed; and every Attempt with Eſcharoticks, will be only a Repetition of Pain to the Patient without any Advantage. In ſcrophulous Ulcers of the Glands, and indeed of almoſt every Part, this Diſorder is very common; but before Trial of the ſevere Eſcharoticks, I would recommend the Uſe of the ſtrong *Precipitate* Medicine, with Compreſs as tight as can be born without Pain, which I think generally keeps it under.

When the Excreſcence is cancerous, and does not riſe from a large Cancer, but only from the Skin itſelf, it has been uſual to recommend the actual Cautery; though I have found it more ſecure, to cut away quite underneath, and dreſs afterwards with eaſy Applications; but the Caſes where either of theſe Methods are practicable, occur very rarely. As to the Treatment of incurable

I have seen this ulcer (viz carious) unattended with this loose flabby flesh, but surrounded with hard edges, the ulcer of smooth surface yielding but pus, & the granulations hard & difficult of imp[illegible] treatment I has been paring the edges & dressing [illegible]

cancerous Ulcerations, after much Trial, Surgeons have at last discovered, that what gives the most Ease to the Sore is the most suitable Application; and therefore the use of Escharoticks is not to be admitted on any Pretence whatsoever; nor in those Parts of a Cancer that are corroded into Cavities, must the *Precipitate* be made use of to procure Digestion, or promote the Separation of the Sloughs. The best way therefore, is to be guided by the Patient what Medicine to continue, after having tried three or four, if the first or second do not agree with him. Those usually prescribed are Preparations from Lead, but what I have found most beneficial, have been sometimes dry Lint alone when it does not stick to the Cancer; at other times, Lint Dossils spread with *Basilicon* or *Cerat. de Lapid. Calam.* and oftener than either with a *Cerate* made of Oil and Wax, or the *Sperm. Cet.* Ointment; and over all, a Pledgit of Tow spread with the same. Embrocating the neighbouring Skin and Edges of it with Milk, is of Service; but the chief Good is to be acquired by Diet, which should be altogether of Milk, and things made of Milk, tho' Herbage may be admitted also. Issues in the Shoulders or Thighs do also alleviate the Symptoms, and

Manna

Manna with the Purging Waters, once, or perhaps twice a-Week, will ſerve to keep the Body cool. All Methods more violent, generally exaſperate Cancers, and are to be rejected in favour of this, which is ſometimes amazing in its Effects, not only procuring Eaſe, but lengthening Life.

When Ulcers or Abſceſſes are accompanied with Inflammation and Pain, they are to be aſſiſted with Fomentations made of ſome of the dry Herbs, ſuch as *Roman* Wormwood, Bay-leaves, and Roſemary; and when they are very putrid and corroſive, which Circumſtances give them the Name of foul Phagædenick Ulcers, ſome Spirits of Wine ſhould be added to the Fomentation, and the Bandage be alſo dipt in Brandy or Spirits of Wine, obſerving in theſe Caſes where there is much Pain, always to apply gentle Medicines till it be removed.

As to the Frequency of dreſſing and fomenting, I think it may be laid down for a Rule in all Sores, that where the Diſcharge is ſanious, and corroſive, twice a-day is not too much: if the Matter be not very putrid and thin, once will ſuffice. When the Pain and Inflammation are exceſſive, Bleeding and other Evacuations will often be ſerviceable; and above all things, Reſt and a horizontal

Arsenick externally applied is now of very general use with D=Physick
—C—

zontal Position; which last Circumstance is of so great Importance to the Cure of Ulcers of the Legs, that unless the Patient will conform to it strictly, the Skill of the Surgeon will often avail nothing; for as the Indisposition of these Sores, is in some measure owing to the Gravitation of the Humours downwards, it will be much more beneficial to lie along than sit upright, tho' the Leg be laid on a Chair; since even in this Posture they will descend with more Force, than if the Body was reclined.

In Ulcers of the Legs accompanied with Varices or Dilatations of the Veins, the Method of Treatment will depend upon the other Circumstances of the Sore; for the Varix can only be assisted by the Application of Bandage, which must be continued a considerable time after the Cure; the neatest Bandage is the strait Stocking, which is particularly serviceable in this Case, though also if the Legs be œdematous, or if after the healing of the Ulcers, they swell when the Patient quits his bed, it may be worn with Safety and Advantage. There are Instances of one Vein only being varicous, which when it happens, may be destroyed by tying it above and below the Dilatation, as in an Aneurism;

riſm; but this Operation ſhould only be practiſed where the Varix is large and painful.

Ulcers of many Years ſtanding are very difficult of Cure, and in old People the Cure is often dangerous, frequently exciting an Aſthma, a Diarrhœa, or a Fever, which deſtroys the Patient unleſs the Sore break out again; ſo that it is not altogether adviſeable to attempt the abſolute Cure in ſuch Caſes, but only the Reduction of them into better Order, and leſs Compaſs, which, if they be not malignant, is generally done with Reſt and proper Care. The Cure of thoſe in young People may be undertaken with more Safety, but we often find it neceſſary to raiſe a Salivation to effect it, though when completed it does not always laſt; ſo that the Proſpect of Cure in ſtubborn old Ulcers, at any time of Life, is but indifferent. In all theſe Caſes, however, it is proper to purge once or twice a-week with *Calomel*, if the Patient can bear it, and to make an Iſſue when the Sore is almoſt healed, in order to continue a Diſcharge the Conſtitution has been ſo long habituated to, and prevent its falling upon the Cicatrix, and burſting out again in that Place.

When

When an Ulcer or Abſceſs has any Sinuſes or Channels opening and diſcharging themſelves into the Sore, they are called ſinuous Ulcers; theſe Sinuſes, if they continue to drain a great while, grow hard in the Surface of their Cavity, and then are termed Fiſtulæ, and the Ulcer a fiſtulous Ulcer; alſo if Matter be diſcharged from any Cavity, as thoſe of the Joints, the Abdomen, *&c.* the Opening is called a ſinuous Ulcer, or a Fiſtula.

The Treatment of theſe Ulcers depends on a Variety of Circumſtances: If the Matter of the Sinus be thick; ſtrict Bandage and Compreſs will ſometimes bring the oppoſite Sides of the Sinus to a Re-union; if the Sinus grow turgid in any Part, and the Skin thinner, ſhewing a Diſpoſition to break, the Matter muſt be made to puſh more againſt that Part, by plugging it up with a Tent; and then a Counter-opening muſt be made, which proves often ſufficient for the whole Abſceſs, if it be not afterwards too much tented, which locks up the Matter and prevents the Healing; or too little, which will have the ſame Effect; for dreſſing quite ſuperficially, does ſometimes prove as michievous as Tents, and for nearly the ſame Reaſon; ſince ſuffering the

the external Wound to contract into a narrow Orifice before the internal one be incarned, does almoſt as effectually lock up the Matter as a Tent: To preſerve then a Medium in theſe Caſes, a hollow Tent of Lead or Silver may be kept in the Orifice, which at the ſame time that it keeps it open, gives Vent to the Matter. The Abſceſſes where the Counter-openings are made moſt frequently, are thoſe of compound Fractures, and the Breaſt; but the latter do oftener well without Dilatation, than the former, tho' it muſt be performed in both, if practicable, the whole Length of the Abſceſs, when after ſome Trial the Matter does not leſſen in Quantity, and the Sides of it grow thinner; and if the Sinuſes be fiſtulous, there is no Expectation of Cure without Dilatation: There are alſo a great many ſcrophulous Abſceſſes of the Neck, that ſometimes communicate by Sinuſes running under large Indurations, in which Inſtances, Counter-openings are adviſeable, and generally anſwer without the Neceſſity of dilating the whole Length; and indeed there are few Abſceſſes in this Diſtemper, which ſhould be opened beyond the Thinneſs of the Skin. When Abſceſſes of the Joints diſcharge themſelves, there is no other Method

thod of treating the Fiſtula, but by keeping it open with the Cautions already laid down, till the Cartilages of the Extremities of the Bones being corroded, the two Bones ſhoot into one another, and form an Anchyloſis of the Joint, which is the moſt uſual Cure of Ulcers in that Part.

Gun-ſhot Wounds often become ſinuous Ulcers, and then are to be conſidered in the ſame Light as thoſe already deſcribed; tho' Surgeons have been always inclined to conceive there is ſomething more myſterious in theſe Wounds than any others; but their Terribleneſs is owing to the violent Contuſion and Laceration of the Parts, and often to the Admiſſion of extraneous Bodies into them, as the Bullet, Splinters, Clothes, *&c.* and were any other Force to do the ſame thing, the Effect would be exactly the ſame as when done by Fire-arms. The Treatment of theſe Wounds, conſiſts in removing the extraneous Body as ſoon as poſſible, to which end the Patient muſt be put into the ſame Poſture as when he received the Wound: if it cannot be extracted by cutting upon it, which ſhould always be practiſed when the Situation of the Blood-veſſels, *&c.* does not forbid; it muſt be left to Nature to work out, and the Wound dreſſed ſuperficially, for we

we muſt not expect, that if it be kept open with Tents, the Bullet, *&c.* will return that way; and there is hardly any Caſe where Tents are more pernicious than here, becauſe of the violent Tenſion and Diſpoſition to gangrene which preſently enſue. To guard againſt Mortification in this, and all other violently contuſed Wounds, it will be proper to bleed the Patient immediately, and ſoon after give a Clyſter; the Part ſhould be dreſſed with ſoft Digeſtives, and the Compreſs and Roller applied very looſe, being firſt dipt in Brandy or Spirits of Wine: The next time the Wound is opened, if it be dangerous, the ſpirituous Fomentation may be employed, and after that, continued till the Danger is over. If a Mortification comes on, the Applications for that Diſorder muſt be uſed: In gun-ſhot Wounds, it ſeldom happens that there is any Effuſion of Blood unleſs a large Veſſel be torn, but the Bullet makes an Eſchar, which uſually ſeparates in a few Days, and is followed with a plentiful Diſcharge; but when the Wound is come to this Period, it is manageable by the Rules already laid down.

When an Ulcer with looſe rotten Fleſh diſcharges more than the Size of it ſhould yield, and the Diſcharge is oily and ſtinking;

ing; in all Probability the Bone is carious; which may eaſily be diſtinguiſhed by running the Probe through the Fleſh, and if ſo, it is called a carious Ulcer: The Cure of theſe Ulcers depends principally upon the Removal of the rotten Part of the Bone, without which it will be impoſſible to heal, as we ſee ſometimes even in little Sores of the lower Jaw, which taking their Riſe from a rotten Tooth, will nor admit of Cure 'till the Tooth be drawn. Thoſe Caries which happen from the Matter of Abſceſſes lying too long upon the Bone, are moſt likely to recover: Thoſe of the Pox very often do well, becauſe that Diſtemper fixes ordinarily upon the middle and outſide of the denſeſt Bones, which admit of Exfoliation; but thoſe produced by the Evil, where the whole Extremities of ſpongy Parts of the Bone are affected, are exceedingly dangerous, tho' all enlarged Bones be not neceſſarily carious; and there are Ulcers ſometimes on the Skin that covers them, which do not communicate with the Bone, and conſequently do well without Exfoliation: Nay, it ſometimes happens, tho' the Caſe be rare, that in young Subjects particularly, the Bones will be carious to ſuch a degree, as to admit a Probe almoſt through the whole Subſtance of

of them, and yet afterwards admit of a Cure, without any notable Exfoliation.

The Method of treating an Ulcer with a Caries, is by applying a Cauſtick of the Size of the Scale of the Bone that is to be exfoliated, and after having laid it bare, to wait 'till ſuch time as the carious Part can, without Violence, be ſeparated, and then heal the Wound: I caution againſt Violence, becauſe the little jagged Bits of Bone that would be left, if we attempted Exfoliation, before the Piece were quite looſe and diſengaged from the ſound Bone, would form little Ulcerations, and very much retard the Cure. In order to quicken the Exfoliation, there have been ſeveral Applications deviſed; but that which has been moſt uſed in all Ages, is the actual Cautery, with which Surgeons burn the naked Bone every Day, or every other Day, to dry up, as they ſay, the Moiſture, and by that Means procure the Separation: but as this Practice is never of great Service, and always cruel and painful, it is now pretty much exploded: Indeed from conſidering the Appearance of a Wound, when a Scale of Bone is taken out of it, there is hardly any queſtion to be made, but that burning retards rather than haſtens the Separation; for as every Scale of a carious Bone

Bone is flung off by new Fleſh generated between it and the ſound Bone, whatever would prevent the Growth of theſe Granulations, would alſo in a degree prevent the Exfoliation; which muſt certainly be the Effect of a red-hot Iron, applied ſo cloſe to it; though the Circumſtances of carious Bones, and their Diſpoſition to ſeparate, are ſo different from one another, that it is hardly to be gathered from Experience, whether they will ſooner exfoliate with or without the Aſſiſtance of Fire: for ſometimes, in both Methods, an Exfoliation is not procured in a Twelvemonth, and at other Times it happens in three Weeks or a Month; nay I have, upon cutting out the Eſchar made by the Cauſtick, taken away at the ſame time a large Exfoliation: However, if it be only uncertain whether the actual Cautery be beneficial or not, the Cruelty that attends the uſe of it, ſhould entirely baniſh it out of Practice. It is often likewiſe in theſe Caſes, employed to keep down the funguous Lips that ſpread upon the Bone; but it is much more painful than the Eſcharotick Medicines; tho' there will be no Need of either, if a regular Compreſs be kept on the Dreſſings; or at worſt,

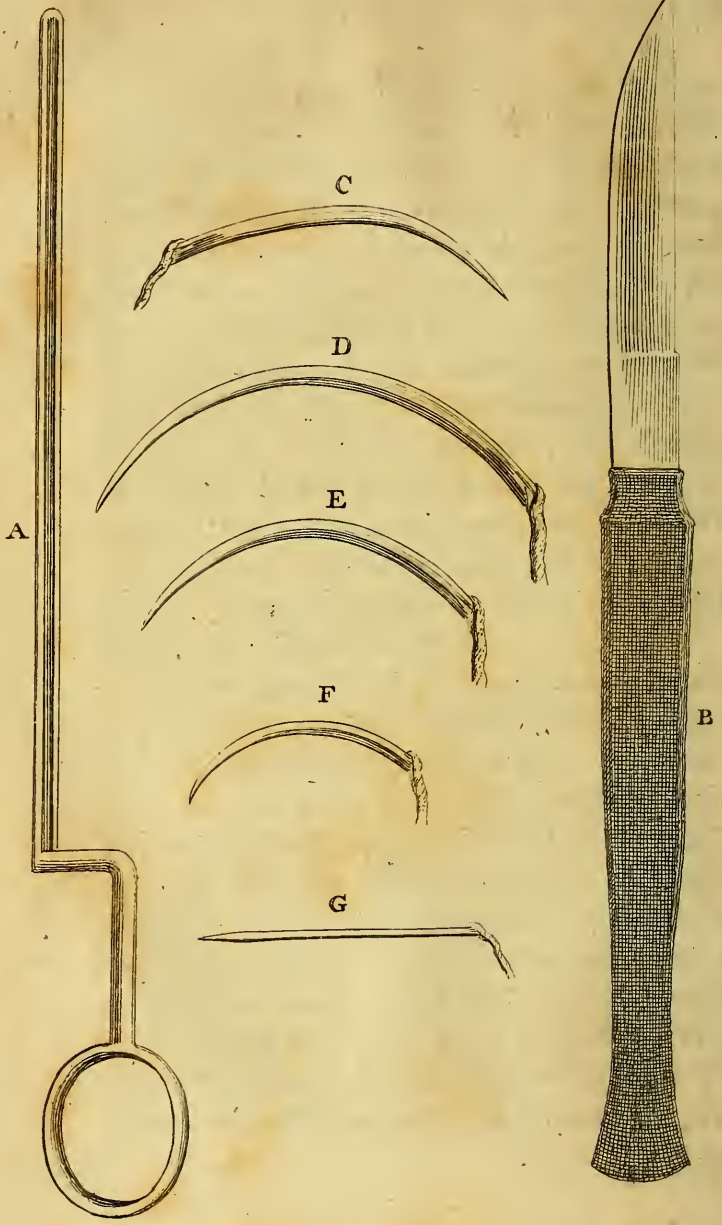
worſt, if a flat Piece of the prepared Sponge, of the Size of the Ulcer, be rolled on with a tight Bandage, it will ſwell on every Side, and dilate the Ulcer without any Pain.

Some Caries of the Bones are ſo very ſhallow that they crumble inſenſibly away, and the Wound fills up; but when the Bone will neither exfoliate nor admit of Granulations, it will be proper to ſcrape it with a Rugine, or perforate it in many Points with a convenient Inſtrument down to the quick. In the Evil, the Bones of the *Carpus* and *Tarſus* are often affected, but their Sponginеſs is the reaſon that they are ſeldom cured: ſo that when theſe, or indeed the Extremities of any of the Bones are carious through their Subſtance, it is adviſeable to amputate; though there are Inſtances in the Evil, but more eſpecially in critical Abſceſſes, where after long dreſſing down, the Splinters, and ſometimes the whole Subſtance of the ſmall Bones, have worked away, and a healthy Habit of Body coming on, the Ulcer has healed; but theſe are ſo rare, that no great Dependence is to be laid on ſuch an Event. The Dreſſings of carious Bones, if they are ſtinking, may be Doſſils dipt in the Tincture of Myrrh, otherwiſe thoſe of dry Lint are eaſieſt, and keep down the Edges

of the Ulcer better than any other gentle Applications.

Burns are generally eſteemed a diſtinct kind of Ulcers, and have been treated with a greater Variety of Applications, than any other Species of Sore, every Author having invented ſome new Medicine to fetch out the Fire, as they imagine; and indeed the Conceit of a Quantity of Fire remaining in the Part burnt, has occaſioned the Trial of very whimſical and painful Remedies: tho' People who talk thus ſeriouſly of Fire in Wounds, do not think of any remaining in a Stick that is half burnt, and ceaſes to burn any farther; notwithſtanding the Reaſoning be the ſame in Burns of the Fleſh, and Burns of a Piece of Wood.

When Burns are very ſuperficial, not raiſing ſuddenly any Veſication, Spirits of Wine are ſaid to be the quickeſt Relief; but whether they be more ſerviceable than Embrocations with Linſeed-oil, I am not certain, though they are uſed very much by ſome Perſons whoſe Trade ſubjects them often to this Misfortune. If the Burn excoriates, I think it is eaſieſt to roll the Part up gently with Bandages dipt in ſweet Oil, or a Mixture of *Unguent. Flor. Sambu.* with the Oil: when the Excoriations are very tender, drop-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dropping warm Milk upon them very Dreſſing is very comfortable; or if the Patient can bear to have Flannels wrung out of it, applied hot, it may be ſtill better: if the Burn have formed Eſchars, they may be dreſſed with *Baſilicon*, though generally Oil alone is eaſier; and in theſe Sores, whatever is the eaſieſt Medicine, will be the beſt Digeſtive. I have ſometimes found it neceſſary to apply different Ointments to Burns, where the Aſpect has been nearly the ſame, and upon changing them, the Patient has complained of great Pain; ſo that we are obliged ſometimes to determine what is proper, from Trial. The moſt likely things to ſucceed at firſt, are, Oil, *Ungt. Flor. Samb. Ungt. Baſilicon*, and a Cerate of Wax and Oil, and afterwards the *Cerate de Lapid. Calam. Ungt. Rub. Deſiccat. Ungt. Sperm. Cet.* the Nutritum with but little Vinegar in it, or perhaps when the *Fungus* riſes, dry Lint. There is great Care neceſſary to keep down the *Fungus* of Burns, and heal the Wound ſmooth, to which end, the Edges ſhould be dreſſed with Lint dipt in *Aqu. Vitriol.* and dried afterwards; or they may be touched with the Vitriol-ſtone, and the Deſſings be repeated twice a-Day. There is alſo greater Danger of Contractions from Burns after

the Cure, than from other Wounds; to obviate which, Embrocations of Neats-foot Oil, and Bandage with Paſte-boards, to keep the Part extended, are abſolutely neceſſary, where they can be applied.

The EXPLANATION.

A. A Director by which to guide the Knife in the opening of Abſceſſes that are burſt of themſelves, or firſt punctured with a Lancet. This Inſtrument ſhould be made either of Steel, Silver, or Iron, but ſo tempered, that it may be bent and accommodated to the direction of the Cavity. It is uſually made quite ſtraight; but that Form prevents the Operator from holding it firmly, while he is cutting; upon which account, I have given mine the Shape here repreſented. The manner of uſing it is, by paſſing the Thumb through the Ring, and ſupporting it with the Fore-finger, while the ſtraight-edged Knife is to ſlide along the Groove with its Edge upwards, towards the Extremity of the Abſceſs.

B. The ſtraight-edged Knife, proper for opening Abſceſſes with the Aſſiſtance of a Director; but which, in few other reſpects, is preferable to the round-edged Knife.

C. A crooked Needle, with its convex and concave Sides ſharp: this is uſed only in the Suture of the Tendon, and is made thin, that but few of the Fibres of ſo ſlender a Body as a Tendon, may be injured in the paſſing of it. This Needle is large enough for ſtiching the *Tendo Achillis*.

D. The largeſt crooked Needle neceſſary for the tying of any Veſſels, and ſhould be uſed with a Ligature of the Size of that I have threaded it with in taking up the Spermatick Veſſels in Caſtration, or the Femoral and Humeral Arteries in Amputation. This Needle may alſo be uſed in ſewing up deep Wounds.

E. A crooked Needle and Ligature of the moſt uſeful Size, being not much too little for the largeſt Veſſels, nor a great deal too big for the ſmalleſt; and therefore in the taking up of the greateſt Number of Veſſels in an Amputation, is the proper Needle to be employed. This Needle alſo is of a convenient Size for ſewing up moſt Wounds.

F. A ſmall crooked Needle and Ligature for taking up the leſſer Arteries, ſuch as thoſe of the Scalp, and thoſe of the Skin that are wounded in opening Abſceſſes.

Great Care ſhould be taken by the Makers of theſe Needles, to give them a due Tem-

per; for if they are too ſoft, the Force ſometimes exerted to carry them through the Fleſh, will bend them; if they are too brittle, they ſnap; both which Accidents may happen to be terrible Inconveniencies, if the Surgeon be not provided with a ſufficient Number of them. It is of great Importance alſo to give them the Form of Part of a Circle, which makes them paſs much more readily round any Veſſel, than if they were made partly of a Circle, and partly of a ſtraight Line, and in taking up Veſſels at the Bottom of a deep Wound is abſolutely neceſſary, it being impracticable to turn the Needle with a ſtraight Handle, and bring it round the Veſſel when in that Situation. The convex Surface of the Needle is flat, and its two Edges are ſharp. Its concave Side is compoſed of two Surfaces, riſing from the Edges of the Needle, and meeting in a Ridge or Eminence, ſo that the Needle has three Sides. This Eminence of the Subſtance of the Needle on its Inſide ſtrengthens it very much, but it is not continued the whole Length of the Needle, which is flat towards the Eye; ſome are made round in this Part, but they cannot be held ſteady between the Finger and Thumb, and are therefore unfit for uſe. There have been Needles made

with

with the Eminence on the convex Side, and a flat Surface on the concave Side, but I do not see any particular Advantage in that Structure. The best Materials for making Ligatures are the flaxen Thread that Shoemakers use; which is sufficiently strong when four, six, or eight of the Threads are twisted together and waxed; and is not so apt to cut the Vessels, as Threads that are more finely spun; though the Prevention of this Accident will depend in a great Measure on the Dexterity of the Operator, who is carefully to avoid the tying them with too great a Force.

G. A straight Needle, such as Glovers use, with a three-edged Point, useful in the uninterrupted Suture, in the Suture of Tendons, where the crooked one *C*, is not preferred, and in sewing up dead Bodies, and is rather more handy for taking up the Vessels of the Scalp.

TREATISE

OF THE

Operations *of* SURGERY.

CHAP. I.

Of SUTURES.

WHEN a Wound is recent, and the Parts of it are divided by a ſharp Inſtrument, without any farther Violence, and in ſuch a manner that they may be made to approach each other, by being returned with the Hands, they will, if held in cloſe Contact for ſome Time, reunite by Inoſculation, and cement like one Branch of a Tree ingrafted on another. To maintain them in this Situation, ſeveral ſorts of Sutures have been invented, and formerly practiſed, but the Number of them has of late been very much reduced. Thoſe now chiefly deſcribed, are the interrupted, the Glover's, the quilled, the twiſted, and the dry Sutures; but the interrupted and twiſted, are almoſt the only uſeful ones; for the

the quilled Suture is never preferable to the interrupted; the dry Suture is ridiculous in terms, ſince it is only a Piece of Plaiſter applied in many different Ways to re-unite the Lips of a Wound; and the Glover's, or uninterrupted Stitch, which is adviſed in ſuperficial Wounds, to prevent the Deformity of a Scar, does rather, by the Frequency of the Stitches, occaſion it, and is therefore to be rejected in favour of a compreſs and ſticking Plaiſter; the only Inſtance where I would recommend it, is in a Wound of the Inteſtine: the Manner of making this Suture I ſhall deſcribe in the Chapter of Gaſtroraphy.

From the Deſcription I have given of the State of a Wound proper to be ſewed up, it may be readily conceived, that Wounds are not fit Subjects for Suture, when there is either a Contuſion, Laceration, Loſs of Subſtance, great Inflammation, Difficulty of bringing the Lips into Appoſition, or ſome extraneous Body inſinuated into them; tho' ſometimes a lacerated Wound may be aſſiſted with one or two Stitches. It has formerly been forbidden to ſew up Wounds of the Head; but this Precaution is very little regarded by the Moderns; though the ill Effects I have frequently ſeen from Matter pent up under the Scalp, and the great Convenience

ence there is of uſing Bandage on the Head, have convinced me, that much leſs Harm would be done, if Sutures were uſed in this Part with more Caution.

If we ſtitch up a Wound that has none of theſe Obſtacles, we always employ the interrupted Suture, paſſing the Needle two, three, or four Times, in Proportion to the Length of it, though there can ſeldom be more than three Stitches required.

The Method of doing it is this: the Wound being emptied of the grumous Blood, and your Aſſiſtant having brought the Lips of it together, that they may lie quite even; you carefully carry your Needle from without, inwards to the Bottom, and ſo on from within, outwards; uſing the Caution of making the Puncture far enough from the Edge of the Wound, which will not only facilitate the paſſing the Ligature, but will alſo prevent it from eating through the Skin and Fleſh; this Diſtance may be three or four tenths of an Inch: as many more Stitches as you ſhall make, will be only Repetitions of the ſame Proceſs. The threads being all paſſed, you begin tying them in the Middle of the Wound, though if the Lips are held carefully together all the while, as they ſhould be, it will be of no great Conſequence

which

which is done firſt. The moſt uſeful Kind of Knot in large Wounds, is a ſingle one firſt, over this, a little Linnen Compreſs, on which is to be made another ſingle Knot, and then a Slip-knot, which may be looſened upon any Inflammation; but in ſmall Wounds, there is no Danger from the double Knot alone, without any Compreſs to tie it upon; and this is moſt generally practiſed. If a violent Inflammation ſhould ſucceed, looſening the Ligature only will not ſuffice; it muſt be cut through and drawn away, and the Wound be treated afterwards without any Suture. When the Wound is ſmall, the leſs it is diſturbed by dreſſing, the better; but in large ones, there will ſometimes be a conſiderable Diſcharge, and if the Threads be not cautiouſly carried through the Bottom of it, Abſceſſes will frequently enſue from the Matter being pent up underneath, and not finding Iſſue. If no Accident happen, you muſt, after the Lips are firmly agglutinated, take away the Ligatures, and dreſs the Orifices which they leave.

It muſt be remembered, that during the Cure, the Suture muſt be always aſſiſted by the Application of Bandage, if poſſible, which is frequently of the greateſt Importance; and that ſort of Bandage with two Heads,

Heads, and a ſlit in the Middle, which is by much the beſt, will in moſt Caſes be found practicable.

The twiſted Suture being principally employed in the Hare-lip, I ſhall reſerve its Deſcription for the Chapter on that Head.

CHAP. II.

Of the SUTURE *of* TENDONS.

WOUNDS of the Tendons are not only known to heal again, but even to admit of ſewing up like thoſe of the fleſhy Parts, tho' they do not re-unite altogether in ſo ſhort a Time. When a Tendon is partly divided, it is generally attended with an exceſſive Pain, Inflammation, *&c.* in conſequence of the remaining Fibres being ſtretched and forced by the Action of the Muſcle, which neceſſarily will contract more, when ſome of its Reſiſtance is taken away: to obviate this Miſchief, it has been hitherto an indiſputable Maxim in Surgery, to cut the Tendon quite through, and immediately afterwards perform the Suture; but I do not think this Practice adviſeable; for though the Diviſion of the Tendon afford preſent Eaſe, yet the mere Flexion of the Joint will have

have the ſame Effect, if, for Example, it be a Wound of a Flexor Tendon: beſides, in order to ſew up the Extremities of the Tendon when divided, we are obliged to put the Limb in ſuch a Situation, that they may be brought into Contact, and even to ſuſtain it in that Poſture to the Finiſhing of the Cure: if then, the Poſture will lay the Tendon in this Poſition, we can likewiſe keep it ſo without uſing the Suture, and more ſure of its not ſlipping away, which ſometimes happens from any careleſs Motion of the Joint, when the Stitches have almoſt worn through the Lips of the Wound; on which account, I would by all means adviſe, in this Caſe, to forbear the Suture, and only to favour the Situation of the Extremities of the Tendon, by placing the Limb properly.

If it ſhould be ſuggeſted, that, for want of a farther Separation, there will not be Inflammation enough to produce an Adheſion of the ſeveral Parts of the Wound, which is particularly mentioned as the Property of this ſort of Cicatrix, though it be likewiſe of all others: I ſay, that the Inflammation will be in Proportion to the Wound, and a ſmall Wound is certainly more likely to recover than a large one. If it ſhould be objected, that keeping the Limb in one Poſture the whole

whole time of the Cure will bring on a Contraction of the Joint, the Objection is as ſtrong againſt the Suture; and now I am upon this Subject, I would adviſe Surgeons to be leſs apprehenſive of Contractions after Inflammations of the Tendons, than Practice ſhews they are: for perhaps there is hardly any one Rule has done more Miſchief than that of guarding againſt this Conſequence; and I would lay it down as a Method to be purſued at all times, to favour the Joint in theſe Diſorders, and keep it in that Poſture we find moſt eaſy for the Patient. The Riſque of an immoveable Contraction in ſix Weeks, is very little, but the Endeavour to avoid it has been the Loſs of many a Limb in half the Time.

But when the Tendon is quite ſeparated, and the Ends are withdrawn from one another, having brought them together with your Fingers, you may ſew them with a ſtraight triangular pointed Needle, paſſing it from without inwards, and from within outwards; in ſmall Tendons, about three Tenths of an Inch from their Extremities, and in the *Tendo Achillis* half an Inch: I have ſometimes employed two Threads in ſewing up the *Tendo Achillis*, and I believe it is generally adviſeable to do ſo, rather than to truſt to a ſingle Suture.

Some

Some Surgeons for fear the Muſcle ſhould contract a little notwithſtanding all our Care, adviſe not to bring the Ends of the Tendon into an exact Appoſition, but to lay one a little over the other, which allowing for the Contraction that always enſues in ſome Degree, the Tendon will become a ſtraight Line, and not be ſhortened in its Length. As the Wound of the Skin will be nearly tranſverſe, I would not have it raiſed to expoſe more of the Tendon, but rather ſewed up with it, which will conduce to the Strength of the Suture. The Knot of the Ligature is to be made as in other Wounds, and the Dreſſings are to be the ſame: there is a ſort of thin crooked Needle that cuts on its concave and convex Sides, which is very handy in the Suture of large Tendons, and to be preferred to the ſtraight one. During the Cure, the Dreſſings muſt be ſuperficial, and the Parts kept ſteady with Paſteboard and Bandage: the ſmall Tendons re-unite in three Weeks, but the *Tendo Achillis* requires ſix at leaſt, and by violent Exerciſe I have known it torn open at the End of ten Weeks; though in the Inſtance I allude to, I brought the lacerated Tendons to a perfect Re-union, without a Suture.

CHAP.

CHAP. III.

Of the GASTRORAPHY.

THE Account of this Operation has engaged the Attention of many ſurgical Writers, and occaſioned much Debate about the proper Rules for performing it; and yet what makes the greateſt Part of the Deſcription, can hardly ever happen in Practice, and the reſt, but very ſeldom. I have been told that *Du Verney*, who was the moſt eminent Surgeon in the *French* Army a great many Years, during the Wars, and Faſhion of Duelling declared he never had once an Opportunity of practiſing the Gaſtroraphy, as that Operation is generally deſcribed; for though the Word, in ſtrictneſs of Etymology, ſignifies no more than ſewing up any Wound of the Belly, yet in common Acceptation, it implies that the Wound of the Belly is complicated with another of the Inteſtine. Now the Symptoms laid down for diſtinguiſhing when the Inteſtine is wounded, do not with any Certainty determine it to be wounded only in one Place, which want of Information, makes it abſurd to open the *Abdomen* in order to come at it; if

ſo, the Operation of ſtitching the Bowels can only take place, where they fall out of the *Abdomen*, and we can ſee where the Wound is, or how many Wounds there are: if it happens that the Inteſtines fall out unwounded the Buſineſs of the Surgeon is to return them immediately, without waiting for ſpirituous or emollient Fomentations; and in caſe they puff up ſo, as to prevent their Reduction by the ſame Orifice, you may, with a Knife or Probe-ſciſſars ſufficiently dilate it for that Purpoſe, or even prick them to let out the Wind, laying it down for a Rule in this, and all Operations where the *Omentum* protrudes, to treat it in the Method I ſhall deſcribe, in the Chapter on the *Bubonocele*.

Upon the Suppoſition of the Inteſtine being wounded in ſuch a manner as to require the Operation, (for in ſmall Punctures it is not neceſſary) the Method of doing it may be this: taking a ſtraight Needle with a ſmall Thread, you lay hold of the Bowel with your left hand, and ſew up the Wound by the Glover's Stitch, that is, by paſſing the Needle thro' the Lips of the Wound, from within outwards all the way, ſo as to leave a Length of Thread at both Ends, which are to hang out of the Inciſion of the *Abdomen*; then carefully making the interrupted Suture

Suture of the external Wound, you pull the Bowel by the ſmall Threads into Contact with the *Peritonæum*, in order to procure an Adheſion, and tye them upon a ſmall Bolſter of Linen; tho' I think it would be more ſecure to paſs the Threads with the ſtraight Needle through the lower Edges of the Wound of the *Abdomen*, which would more certainly hold the Inteſtine in that Situation. In about ſix Days, it is ſaid the Ligature of the Inteſtine will be looſe enough to be cut and drawn away, which muſt be done without great Force; in the Interim, the Wound is to be treated with ſuperficial Dreſſings, and the Patient to be kept very ſtill and low.

CHAP. IV.

Of the BUBONOCELE.

WHEN the Inteſtine or *Omentum* falls out of the *Abdomen* into any Part, the Tumour in general is known by the Name of *Hernia*, which is farther ſpecified either from the Difference of Situation, or the Nature of its Contents. When the Inteſtine or *Omentum* falls through the Navel, it is called a *Hernia Umbilicalis*, or *Exomphalos*; when thro' the Rings of the Abdominal Muſcles into the Groin, *Hernia Inguinalis*; or if into

the *Scrotum, Scrotalis:* theſe two laſt, tho' the firſt only is properly ſo called, are known by the Name of *Bubonocele.* When they fall under the *Ligamentum Fallopii,* thro' the ſame Paſſage that the *Iliac* Veſſels creep into the Thigh, it is called *Hernia Femoralis.* The *Bubonocele* is alſo ſometimes accompanied with a Deſcent of the Bladder: however, the Caſe is very rare; but when it occurs, it is known by the Patient's Inability to urine, till the *Hernia* of the Bladder is reduced within the *Pelvis.* With regard to the Contents characteriſing the Swelling, it is thus diſtinguiſhed: if the Inteſtine only is fallen, it becomes an *Enterocele;* if the *Omentum (Epiploon) Epiplocele;* and if both, *Entero-Epiplocele.* There is beſides theſe, another kind of *Hernia* mentioned and deſcribed by the Moderns, when the Inteſtine or *Omentum* is inſinuated between the Interſtices of the Muſcles, in different Parts of the Belly This *Hernia* has derived its Name from the Place affected, and is called the *Hernia Ventralis;* and laſtly, there have been a few Inſtances, where the Inteſtines or *Omentum* have fallen through the great *Foramen* of the *Iſchium* into the internal Part of the Thigh, between and under the two anterior Heads of the *Triceps* Muſcle.

All

All the Kinds of *Hernias* of the Inteſtines and *Omentum*, are owing to a preternatural Dilatation of the particular Orifices through which they paſs, and not to a Laceration of them, which laſt Opinion (together with a ſuppoſed Laceration of the *Peritonæum*) has however prevailed ſo much, as by way of Eminence to give Name to the Diſorder, which is known more by that of Rupture, than any of thoſe I have mentioned; on which account I ſhall beg leave to make uſe of it myſelf.

The Rupture of the Groin, or *Scrotum*, is the moſt common Species of *Hernia*, and in young Children is very frequent, but it rarely happens in Infancy, that any Miſchiefs ariſe from it. For the moſt part, the Inteſtine returns of itſelf into the Cavity of the *Abdomen*, whenever the Perſon lies down, at leaſt a ſmall Degree of Compreſſion will make it. To ſecure the Inteſtine when returned into its proper Place, there are Steel-truſſes now ſo artfully made, that by being accommodated exactly to the Part, they perform the Office of a Bolſter, without galling, or even ſitting uneaſy on the Patient. Theſe Inſtruments are of ſo great Service, that were People who are ſubject to Ruptures always to wear them, I believe very few

would die of this Diſtemper; ſince it often appears, upon Enquiry, when we perform the Operation for the *Bubonocele*, that the Neceſſity of the Operation is owing to the Neglect of wearing a Truſs.

In the Application of a Truſs to theſe kinds of Swellings a great deal of Judgment is ſometimes neceſſary, and for want of it, we daily ſee Truſſes put even on *Bubos*, indurated Teſticles, *Hydroceles*, *&c.* But for the *Hernias* I have deſcribed, I ſhall endeavour to lay down two or three Rules, in order to guide more poſitively to the Propriety of applying or forbearing them.

If there is a Rupture of the Inteſtine only, it is eaſily, when returned into the *Abdomen*, ſupported by an Inſtrument; but if of the *Omentum*, notwithſtanding it may be returned, yet I have ſeldom found the Reduction to be of much Relief, unleſs there is only a ſmall Quantity of it; for the *Omentum* will lie uneaſy in a Lump at the Bottom of the Belly, and upon Removal of the Inſtrument, drop down again immediately; upon which account, ſeeing the little Danger and Pain there is in this kind of *Hernia*, I never recommend any think but a Bag-truſs, to ſuſpend the *Strotum*, and prevent poſſibly by that means, the Increaſe of the Tumour.

The

The difference of theſe Tumours will be diſtinguiſhed by the Feel; that of the *Omentum*, feeling flaccid and rumpled, the other more even, flatulent, and ſpringy.

Sometimes, in a Rupture of both the Inteſtine and *Omentum*, the Gut may be reduced, but the *Omentum* will ſtill remain in the *Scrotum*, and when thus circumſtanced, moſt Surgeons adviſe a Bag-truſs only, upon a Suppoſition that the Preſſure of a Steel one, by ſtopping the Circulation of the Blood in the Veſſels of the *Omentum*, would bring on a Mortification: but I have learnt, from a multitude of thoſe Caſes, that if the Inſtrument be nicely fitted to the Part, it will be a Compreſs ſufficient to ſuſtain the Bowel, and, at the ſame time, not hard enough to injure the *Omentum*; ſo that, when a great Quantity of Inteſtine falls down, tho' it be complicated with the Deſcent of the *Omentum*, the Rupture will conveniently and ſafely admit of this Remedy.

There are ſome Surgeons, who, to prevent the Trouble of wearing a Truſs, when the Inteſtine is reduced, deſtroy the Skin over the Rings of the Abdominal Muſcles with a Cauſtic of the Size of a half Crown-piece, and keep their Patients in Bed till the Cure of the Wound is finiſhed; propoſ-

ing by the Stricture of the Cicatrix to support it in the *Abdomen* for the future: but, by what I have seen, the Event, tho' often successful, is not answerable to the Pain and Confinement; for if, after this Operation, the Intestine should again fall down, which sometimes happens, there might possibly be more Danger of a Strangulation, than before the Scar was made. This Practice seems to be more adviseable on Women than Men; because in Men, the Danger of injuring the spermatic Cord, sometimes intimidates us from using a Caustic of sufficient Strength to do the proper Office.

I have hitherto considered the Rupture as moveable; but it happens frequently, that the Intestine, after it has passed the Rings of the Muscles, is presently inflamed, which enlarging the Tumour, prevents the Return of it into the *Abdomen*, and becoming every Moment more and more strangled,, it soon tends to a Mortification, unless we dilate the Passages thro' which it is fallen, with some Instrument, to make Room for its Return; which Dilatation is the Operation for the *Bubonocele*.

It rarely happens that Patients submit to this Incision before the Gut is mortified, and it is too late to do Service; not but that there

there are Inſtances of People ſurviving ſmall Gangrenes, and even perfectly recovering aftewards. I myſelf have been an Eye-witneſs of the Cure of two Patients, who, ſometime after the Operation, when the Eſchar ſeparated, diſcharged their Fæces thro' the Wound, and continued to do ſo for a few Weeks in ſmall Quantities, when at length the Inteſtine adhered to the external Wound, and then was fairly healed.

In Mortifications of the Bowels, when fallen out of the *Abdomen* into the Navel, it is not very uncommon for the whole grangrened Inteſtine to ſeparate from the ſound one, ſo that the Excrement muſt neceſſarily ever after be diſcarged at that Orifice: there are likewiſe a few Inſtances, where the Rupture of the *Scrotum* has mortified, and become the *Anus*, the Patient doing well in every other reſpect; nay, I have had one Inſtance of this Nature under my Care, in which the Excrements were voided totally by the *Scrotum* for three Weeks or a Month, yet by Degrees, as the Wound healed, they paſſed off chiefly in their natural Courſe, and at laſt almoſt wholly ſo. Theſe Caſes, however, are only mentioned to furniſh Surgeons with the Knowledge of the poſſibility of ſuch Events, and not to miſlead

miſlead them ſo far as to make favourable Inferences with regard to Gangrenes of the Bowels, which generally are mortal.

Before the Performance of the Operation for the *Bubonocele*, which is only to be done in the Extremity of Danger, the milder Methods are to be tried; theſe are, ſuch as will conduce to ſoothe the Inflammation; for as to the other Intent of ſoftening the Excrements, I believe it is much to be queſtioned, whether there can be any of that degree of Hardneſs as to form the Obſtruction; and, in fact, thoſe Operators who have unluckily wounded the Inteſtine, have proved, by the thin Diſcharge of Fæces which has followed upon the Inciſion, that the Induration we feel, is the Tenſion of the Parts, and not the hardened Lumps of Excrement.

Perhaps, except the Pleuriſy, no Diſorder is more immediately relieved by plentiful Bleeding than this; Clyſters repeated, one after another, three or four times, if the firſt or ſecond are either retained too long, or immediately returned, prove very efficacious; theſe are ſerviceable, not only as they empty the great Inteſtines of their Excrements and Flatulencies, which laſt are very dangerous, but they likewiſe prove a comfortable Fomentation, by paſſing through the

the Colon all around the *Abdomen*. The *Scrotum* and Groin muſt, during the Stay of the Clyſter, be bathed with warm Stoops wrung out of a Fomentation; and after the Part has been well fomented, you muſt attempt to reduce the Rupture: for this Purpoſe, let your Patient be laid on his Back, ſo that his Buttocks may be conſiderably above his Head; the Bowels will then retire towards the Diaphragm, and give way to thoſe which are to be puſhed in. If, after endeavouring two or three Minutes, you do not find Succeſs, you may ſtill repeat the Trial: I have ſometimes, at the End of a Quarter of an Hour, returned ſuch as I thought deſperate, and which did not ſeem to give way in the leaſt, 'till the Moment they went up; however, this muſt be practiſed with a Caution, for too much rough handling will be penicious.

If, notwithſtanding theſe Means, the Patient continues in very great Torture, tho' not ſo bad as to threaten an immediate Mortification, we muſt apply ſome ſort of Pultice to the *Scrotum*: that which I uſe in this Caſe, is, equal Parts of Oil and Vinegar made into a proper Conſiſtence with Oatmeal: After ſome few Hours, the Fomentation is to be repeated, and the other Directions

rections put in Practice ; and if these do not succeed, I am inclined to think it advisable, to prick the Intestine in five or six Places with a Needle, as recommended by *Peter Lowe*, an old *English* Writer, who says, He has often experienced the good Effects of this Method in the inguinal *Hernia*, when all other Means have failed.

After all, should the Pain and Tenseness of the Part continue, and Hiccoughs and Vomitings of the Excrements succeed, the Operation must take place ; for if you wait 'till a languid Pulse, cold Sweats, subsiding of the Tumour, and emphysematous Feel come on, it will be most likely too late, as they are pretty sure Symptoms of a Mortification.

To conceive rightly of the Occurrences in this Operation, it must be remembered, that in every Species of Rupture, a Portion of the *Peritonæum* generally falls down with whatever makes the *Hernia* ; which from the Circumstance of containing immediately the contents of the Tumour, is called the *Sac* of the *Hernia*. Now, the Portion of the *Peritonæum*, which usually yields to the Impulsion of the descending *Viscera*, is that which corresponds with the inmost Opening of the Abdominal Muscles,

Muſcles, juſt where the *Membrana Cellularis Peritonæi* begins to form the *Tunica Vaginalis* of the Spermatic Cord, ſo that the *Sac* with the *Viſcera* inſinuate themſelves into the *Tunica Vaginalis* of the Spermatic Cord, and lie upon the *Tunica Vaginalis* of the Teſticle: nevertheleſs, upon Examination, I have alſo frequently found the Contents of the *Hernia* in Contact with the Teſticle itſelf, that is to ſay, within the *Tunica Vaginalis* of the Teſticle; which I confeſs has ſurpriſed me, as one would imagine that it could not have been effected, but by burſting through the *Peritonæum.* But a late Diſcovery has offered an eaſy Solution of this Appearance; which is now eſtabliſhed as a Fact, though eſteemed a few Years ſince as incredible. It appears, by this Diſcovery, that for ſome Months during Geſtation, the *Teſtes* of the *Fœtus* remain in the *Abdomen*, and when they deſcend into the *Tunica Vaginalis*, there is an immediate Communication betwixt the Cavity of the *Abdomen*, and the Cavity of the *Tunica Vaginalis*, which, in proceſs of Time, becomes obliterated by the Coalition of the *Tunick*, with the Cord; but if it happen before the Coalition be effected, that the Inteſtine or the *Omentum* fall into the

the *Scrotum*, they will neceſſarily remain in Contact with the *Teſtis*: and in this manner, what we eſteemed ſo extraordinary a phenomenon, is readily accounted for.

From this Deſcription of the Deſcent of the *Viſcera*, it is evident that the *Herniary Sac* is contained within the *Tunica Vaginalis*, and ought to give the Idea of one Bag incloſing another; but in the Operation, this Diſtinction of Coats does not always appear: for the *Herniary Sac* ſometimes adheres ſo firmly to the *Tunica Vaginalis*, that together they make but one thick Coat: this Adheſion may poſſibly reſult from the preſent Inflammation of the Parts, which has rendered the Operation neceſſary; but I am inclined to believe, that the *Herniary Sac* adheres in all *Bubonoceles*, which are not very recent, and that, when we reſtore the *Hernia* into the *Abdomen*, and ſupport it by a Truſs, it is only the *Viſcera*, and not the *Herniary Sac* which is reduced; at leaſt I have found this is to be the Caſe in ſeveral that I have diſſected.

The beſt way of laying your Patient will be on a Table about three Feet four Inches high, letting his Legs hang down; then properly ſecuring him, you begin your Inciſion above the Rings of the Muſcles, beyond

yond the Extremity of the Tumour, and bring it down about half the Length of the *Scrotum*, through the *Membrana adipoſa*, which will require very little Trouble to ſeparate from the *Tunica Vaginalis*, and conſequently, will expoſe the Rupture for the farther Proceſſes of the Operation; but I cannot help once more recommending it as a thing of great Conſequence, to begin the external Inciſion high enough above the Rings, ſince there is no Danger in that Part of the Wound: and for want of the Room this Inciſion allows, the moſt expert Operators are ſometimes tedious in making the Dilatation. If a large Veſſel is opened by the Inciſion, it muſt be taken up before you proceed further.

When the *Tunica Vaginalis* is laid bare, you muſt cut carefully through it and the *Peritonæum*, in order to avoid pricking the Inteſtines; though, to ſay the Truth, there is not quite ſo much Danger of this Accident as is repreſented; for ſometimes the Quantity of Water ſeparated in the *Sac* of the *Peritonæum*, raiſes it from the Inteſtine, and prevents any ſuch Miſchief.

It has been conſidered by ſome as an Improvement in the Operation, where the Diſorder is recent, to forbear wounding the

Peri-

Peritonæum, and to return the *Sac* intire into the *Abdomen*, thinking, by this Means, to make a firmer Cicatrix, and more ſurely to prevent a Relapſe for the future; but beſides that, it is often impracticable by reaſon of its Adheſion, the ſeeming Neceſſity there is of letting out the Waters that are frequently fœtid, of taking away any Part of the *Omentum* that may poſſibly be mortified, and which we cannot come at without the Inciſion, and laſtly of leaving an Opening for the Iſſue of the Excrements out of the Wound, in caſe an Eſchar ſhould drop from the Inteſtine; (all which Accidents happen ſometimes very early) put out of Diſpute, in my Opinion, the Impropriety of this Method.

The *Peritonæum* being cut through, we arrive to its Contents, the Nature of which will determine the next Proceſs: for if it is Inteſtine only, it muſt directly be reduced; but if there is any mortified *Omentum*, it muſt be cut off; in order to which it is adviſed to make a Ligature above the Part wounded, to prevent an Hæmorrhage; but it is quite needleſs, and in ſome meaſure, pernicious, as it puckers up the Inteſtine, and diſorders its Situation, if made cloſe to it: for my Part, I am very jealous that

Wounds

Wounds of the *Omentum* are dangerous, on which account I cannot paſs over this Proceſs of the Operation, without cautioning againſt cutting any of it away, unleſs it is certainly gangrened; and when that happens, I think it adviſeable to cut off the mortified part with a Pair of Sciſſars, near to the ſound Part, leaving a ſmall Portion of it to ſeparate in the *Abdomen*; which may be done with as much Safety, as to leave the ſame Quantity below a Ligature.

When the *Omentum* is removed, we next dilate the Wound; to do which with Safety, an infinite Number of Inſtruments have been invented; but in my Opinion, there is none we can uſe in this Caſe with ſo good Management as a Knife; and I have found my Finger in the Operation a much better Defence againſt pricking the Bowels, than a Director which I intended to employ: the Knife muſt be a little crooked and blunt at its Extremity, like the End of a Probe. Some Surgeons perhaps may not be ſteady enough to cut dexterouſly with a Knife, and may therefore perform the Inciſion with Probe-ſciſſars, carefully introducing one Blade between the Inteſtine and Circumference of the Rings, and dilating upwards, and a little obliquely outwards. When the

Finger and Knife only are employed, the Manner of doing the Operation, will be by preſſing the Gut down with the Fore-finger, and carrying the Knife between it and the Muſcles, ſo as to dilate upwards about an Inch, which will be a Wound generally large enough: but if, upon Examination, it ſhall appear that the Inteſtine is ſtrangulated within the *Abdomen*, which may poſſibly happen from a Contraction of the *Peritonæum* near the Entrance into the *Sac*; in that Caſe, the Inciſion muſt be continued through the Length of the contracted Channel, or the Conſequence will be fatal, notwithſtanding the Inteſtine be reſtored into the *Scrotum:* on this account the Operator ſhould paſs his Finger up the *Sac* into the *Abdomen*, after the Reduction of the Gut, in order to diſcover whether it be ſafely returned into its proper Place.

The Opening being made, the Inteſtine is gradually to be puſhed into the *Abdomen*, and the Wound to be ſtitched up; for this Purpoſe, ſome adviſe the quilled, and others the interrupted Suture, to be paſſed through the Skin and Muſcles; but as there is not ſo much Danger of the Bowels falling out when a Dreſſing and Bandage are applied, and the Patient all the while kept upon

upon his Back, but that it may be prevented by one or two ſlight Stitches through the Skin only, I think it by all means adviſeable to follow this Method, ſince the Stricture of a Ligature in theſe tendinous Parts may be dangerous.

Hitherto, in the Deſcription of the *Bubonocele*, I have ſuppoſed the Contents to be looſe, or ſeparate in the *Sac*, but it happens ſometimes in an Operation, that we find not only an Adheſion of the Outſide of the *Peritonæum* to the *Tunica Vaginalis*, and ſpermatic Veſſels, but likewiſe of ſome Part of the Inteſtines to its internal Surface; and in this Caſe there is ſo much Confuſion that the Operator is often obliged to extirpate the Teſticle, in order to diſſect away and diſintangle the Gut, though if it can be done without Caſtration it ought: I believe however, this Accident happens rarely, except in thoſe Ruptures that have been a long time in the *Scrotum* without returning; in which Caſe the Difficulty and Hazard of the Operation are ſo great, that, unleſs urged by the Symptoms of an inflamed Inteſtine, I would not have it undertaken. I have known two Inſtances of Perſons ſo uneaſy under the Circumſtance of ſuch a Load in their *Scrotum*, though

not otherwiſe in Pain, as to deſire the Operation; but the Event in both proved fatal; which I think ſhould make us cautious how we expoſe a Life for the Sake of a Convenience only, and teach our Patients to content themſelves with a Bag-truſs, when in this Condition.

The dreſſing of the Wound firſt of all may be with dry Lint, and afterwards as directed in the Introduction.

The Operation of the *Bubonocele* in Women ſo nearly reſembles that performed on Men, that it requires no particular Deſcription, only in them the Rupture is formed by the Inteſtine or *Omentum* falling down through the Paſſage of the *Ligamentum Rotundum* into the Groin, or one of the *Labia Pudendi*; where cauſing the ſame Symptoms, as when obſtructed in the *Scrotum*, it is to be returned by the Dilatation of that Paſſage.

CHAP. V.

Of the EPIPLOCELE.

THere have been a few Inſtances where ſo great a Quantity of the *Omentum* has fallen into the *Scrotum*, that by drawing

ing the Stomach and Bowels downwards, it has excited Vomitings, Inflammation, and the ſame Train of Symptoms as happen in a *Bubonocele*, in which Caſe the Operation of opening the *Scrotum* is neceſſary: the Inciſion muſt be made in the manner of that for the Rupture of the Inteſtine, and the ſame Rules obſerved with regard to the *Omentum*, that are laid down in the laſt Chapter. It is neceſſary alſo, the Rings of the Muſcles ſhould be dilated, or otherwiſe, though you have taken away ſome of the mortified Part of the *Omentum*, the reſt that is out of its Place, and ſtrangled in the Perforation, will gangrene alſo. The Wound is to be treated in the ſame manner, as that after the Operation, of the *Bubonocele*. What I have here deſcribed as an Inducement to the Operation, ſhould, by the Experience I have had, be the only one. There are a great many People, who are ſo uneaſy with Ruptures, though they are not painful, that a little Encouragement from Surgeons of Character will make them ſubmit to any Means of Cure; but as I have ſeen two or three Patients, who were in every reſpect hale and ſtrong, die a few Days after the Operation, the Event, though very ſurpriſing, ſhould be a Leſſon,

never to recommend this Method of treating an *Epiplocele*, unleſs it is attended with Inflammation, *&c.*

CHAP. VI.

Of the HERNIA FEMORALIS.

THIS Species of Rupture is the ſame in both Sexes, and formed by the falling of the *Omentum* or Inteſtine, or both of them, into the Inſide of the Thigh, thro' the Arch made by the *Os Pubis*, and *Ligamentum Fallopii*, where the Iliac Veſſels and Tendons of the *Pſoas* and *Illiacus internus* Muſcles paſs from the *Abdomen*. It is very neceſſary Surgeons ſhould be aware of the Frequency of this Diſorder, which creates the ſame Symptoms as other Ruptures, and muſt firſt of all be treated by the ſame Methods: the manner of operating in the Reduction, is here too ſo exactly the ſame, with the Difference of dilating the Ligament inſtead of the Rings of the Muſcles, that it would be a mere Repetition of the Operation for the *Eubonocele* to give any Deſcription of it; only it may be obſerved, that the ſpermatic Cord as it enters into the *Abdomen*, lies nearly tranſverſe to the Inciſion

ſion, and cloſe in Contact with the Ligament, ſo that, unleſs you make the Dilatation obliquely outwards, inſtead of perpendicularly upwards, you will probably divide thoſe Veſſels.

CHAP. VII.

Of the EXOMPHALOS.

THIS Rupture is owing to a Protruſion of the Inteſtine, or *Omentum*, or both of them, at the Navel, and rarely happens to be the Subject of an Operation; for though the Caſe is common, yet moſt of them are gradually formed from very ſmall Beginnings, and if they do not return into the *Abdomen* upon lying down, in all Probability they adhere without any great Inconvenience to the Patient, 'till ſome time or other an Inflammation falls upon the Inteſtines, which ſoon brings on a Mortification, and Death; unleſs by great Chance, the mortified Part ſeparates from the ſound one, leaving its Extremity to perform the Office of an *Anus:* in this Emergency, however, I think it adviſeable to attempt the Reduction, if called in at the Beginning, tho' the univerſal Adheſion of the *Sac* and

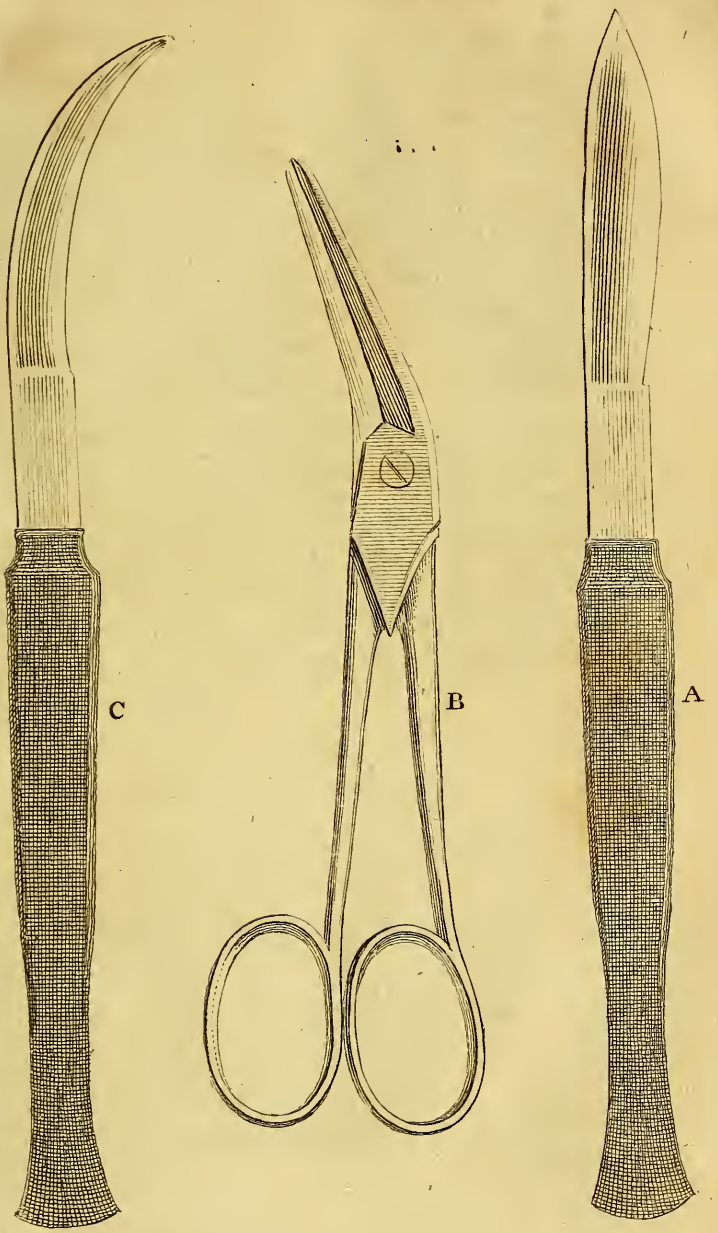
its Contents, are a great Obſtacle to the Succeſs: the Inſtance in which it is moſt likely to anſwer, is, when the Rupture is owing to any Strain, or ſudden Jerk, and is attended with thoſe Diſorders which follow upon the Strangulation of a Gut.

In this Caſe, having tried all other Means, in vain, the Operation is abſolutely neceſſary; which may be thus performed: make the Inciſion ſomewhat above the Tumour, on the left Side of the Navel, through the *Membrana Adipoſa*; and then emptying the *Sac* of its Water, or mortified *Omentum*, dilate the Ring with the ſame crooked Knife, conducted on your Finger, as in the Operation for the *Bubonocele*; after this, return the Inteſtines and *Omentum* into the *Abdomen*, and dreſs the Wound without making any Ligature, but of the Skin only.

CHAP. VIII.

Of the HERNIA VENTRALIS.

THE *Hernia Ventralis* which ſometimes appears between the *Recti* Muſcles is very large; but that Tumour which requires the Operation, is ſeldom bigger than a Wal-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a Walnut, and is a Diſeaſe not ſo common as to have been obſerved by many; but there are Caſes enough known, to put a Surgeon upon Enquiry after it, when the Patient is ſuddenly taken with all the Symptoms of a Rupture, without any Appearance of one in the Naval, Scrotum, or Thigh: I have before defined this *Hernia* to be a Strangulation of the Gut, in ſome of the Interſtices of the Muſcles of the *Abdomen:* the manner of dilating it will be the ſame as that above directed in the other *Hernias:* after the Operation in this, and all *Hernias* where the Inteſtines have been reduced, it will be convenient to wear a Truſs, ſince the Cicatrix is not always firm enough in any of them, to prevent a Relapſe.

PLATE II.

The EXPLANATION.

A. The round-edged Knife, of a convenient Size for almoſt all Operations where a Knife is uſed: the Make of it will be better underſtood by the Figure than any other Deſcription; only it may be remarked, that the Handle is made of a light Wood,

Wood, as indeed the Handles of all Inſtruments ſhould be, that the Reſiſtance to the Blades may be better felt by the Surgeon.

B. A Pair of Probe-ſciſſars, which require nothing very particular in their Form, but that the lower Blade ſhould be made as ſmall as poſſible, ſo that it is ſtrong and has a good Edge; becauſe being chiefly uſed in Fiſtulas in *Ano*, the Introduction of a thick Blade into the Sinus, which is generally narrow, would be very painful to the Patient.

C. The crooked Knife with the Point blunted, uſed in the Operation of the *Bubonocele*.

CHAP. IX.

Of the HYDROCELE.

THE *Hydrocele*, called alſo *Hernia Aquoſa*, *Hydrops Scroti*, and *Hydrops Teſtis*, is a watery Tumour of the *Scrotum*; which, notwithſtanding the Multiplicity of Diſtinctions uſed by Writers, is but of two Kinds; the one, when the Water is contained in the *Tunica Vaginalis*; and the other, when in the *Membrana Cellularis Scroti*:

Scroti; this laſt, is almoſt always complicated with an *Anaſarca*, which Species of Dropſy, is an Extravaſation of Water lodged in the Cells of the *Membrana Adipoſa*; and when thus circumſtanced, will not be difficult to be diſtinguiſhed; beſides that it is ſufficiently characteriſed by the ſhining and ſoftneſs of the Skin, which gives way to the leaſt Impreſſion, and remains pitted for ſome time. The *Penis* is likewiſe ſometimes enormouſly enlarged, by the Inſinuation of the Fluids into the *Membrana Cellularis*, all which Symptoms are abſolutely wanting in the Dropſy of the *Tunica Vaginalis*.

In the Dropſy of the *Membrana Cellularis Scroti*, the Puncture with the Trocar, is recommended by ſome, and little Orifices made here and there with the Point of a Lancet, by others; or a ſmall Skane of Silk paſſed by a Needle through the Skin, and out again at the Diſtance of two or three Inches, to be kept in the manner of a Seton till the Waters are quite drained: but the two firſt Methods avail very little, as they open but few Cells; and the laſt, cannot be ſo efficacious in that reſpect as Inciſions, and will be much more apt to become troubleſome, and even to gangrene.

Indeed

Indeed it is not often proper to perform any Operation at all upon this Part, ſince the *Membrana Cellularis Scroti*, being a Continuation of the *Membrana Adipoſa*, Scarifications made through the Skin in the Small of the Legs, will effectually empty the *Scrotum*, as I have many Times experienced; and this Place ought rather to be pitched upon than the other, as being more likely to anſwer the Purpoſe by reaſon of its Dependency: however, it ſometimes happens, that the Waters fall in ſo great Quantities into the *Scrotum*, as by diſtending it, to occaſion great Pain, and threaten a Mortification: the Prepuce of the *Penis* alſo becomes very often exceſſively dilated, and ſo twiſted, that the Patient cannot void his Urine. In theſe two Inſtances, I would propoſe an Inciſion of three Inches long to be made on each Side of the *Scrotum*, quite through the Skin into the Cells containing the Water, and two or three, of Half an Inch long, in any Part of the *Penis*, with a Lancet or Knife; all which may be done with great Safety, and ſometimes with the Succeſs of carrying off the Diſeaſe of the whole Body. This I can poſitively ſay, that though I have done it upon Perſons in a very languid Condition, yet, by making

ing the Wound with a ſharp Inſtrument, and treating it afterwards with Fomentations and ſoft Digeſtives, I have rarely ſeen any Inſtance of a Gangrene, which is generally ſo much apprehended in this Caſe.

The Dropſy of the *Tunica Vaginalis*, is owing to a preternatural Diſcharge of that Water which is continually ſeparating in a ſmall Quantity, on the internal Surface of the Tunick, for the moiſtening or lubricating the Teſticle, and which, collecting too faſt, accumulates and forms in Time, a Swelling of great magnitude: this is what I take to be the other Species of *Hydrocele*, and the only one beſides; though from the Time of *Celſus*, down to our own Days, the Writers on this Subject make two Kinds; one on the Inſide of the *Tunica Vaginalis*, and another between the *Scrotum* and Outſide of it; and among the Cauſes aſſigned for this Diſtemper, the principal one is the Derivation of Water from the *Aſcites*, which Opinion, though univerſally received, is abſurd in Anatomy: for beſides that People afflicted with a *Hydrocele*, are very ſeldom otherwiſe dropſical; and on the contrary, thoſe with an Aſcites, have no *Hydrocele*; the *Tunica Vaginalis* is like a Purſe totally ſhut up on the Outſide of the

Ab-

Abdomen, ſo that no Water from any Part can inſinuate into it; and with reſpect to the Notion of Water falling from the *Abdomen* into the *Tunica Vaginalis* and *Scrotum*, it is equally impoſſible; for though in the *Hernia Inteſtinalis*, the Gut falls into this Part, yet in that Caſe the *Peritonæum* (which would hinder the Egreſs of the Water) falls down too, which the Ancients did not know, and the Moderns have omitted to reflect on in relation to this Subject: it is true, that where the *Aſcites* is complicated with a *Hernia Inteſtinalis*; or where there has been a previous *Hernia* of the *Scrotum*, and the *Sac* of the *Peritonæum* remains within the *Scrotum*, the Water of the *Aſcites*, in that Caſe, may fall into the *Sac* of the *Peritonæum*, and in that manner form a Tumour of the *Scrotum*; but this is not properly a Dropſy of the *Tunica Vaginalis*. It muſt be here underſtood, that when I ſay there is no Communication between the Cavity of the *Abdomen*, and the Cavity of the *Tunica Vaginalis*, I ſpeak of Adults; for in the *Fœtus*, and even in an infant State, there is a Communication; and in thoſe few Inſtances, where the Communication is preſerved to adultneſs, the Water of an *Aſcites* may fall into the *Tunica*

ca Vaginalis: but this happens ſo rarely, that it ſhould not be conſidered as an Impeachment of the preceding Doctrine.

The *Hydrocele* of the *Tunica Vaginalis*, is very eaſily to be diſtinguiſhed from the *Hydrocle* of the *Membrana Cellularis*, by the preceding Deſcription of that Species of Dropſy: I ſhall now explain how it differs from the other Tumours of the *Scrotum*, viz. the *Bubonocele*, *Epiplocele*, and enlarged Teſticle: in the firſt Place, it is ſeldom or never attended with Pain in the Beginning, and is very rarely to be imputed to any Accident, as the *Hernias* of the *Omentum* and Inteſtine are: from the Time it firſt makes it Appearance, it very ſeldom is known to diſappear or diminiſh, but generally continues to increaſe, though in ſome much faſter than in others; in one Perſon growing to a very painful Diſtention in a few Months, whilſt in another, it ſhall not be troubleſome in many Years; nay, ſhall ceaſe to ſwell at a certain Period, and ever after continue in that State without any notable Diſadvantage; tho' this laſt Caſe very rarely happens: in Proportion as it enlarges it becomes more tenſe, and then is ſaid to be tranſparent; indeed the Tranſparency is made the chief Criterion

rion of the Diſtemper, it being conſtantly adviſed to hold a Candle on one Side of the *Scrotum*, which it is ſaid will ſhine through to the other, if there be Water: but this Experiment does not always anſwer, becauſe ſometimes the *Tunica Vaginalis* is very much thickened, and ſometimes the Water itſelf is not tranſparent: ſo that to judge poſitively if there be a Fluid, we muſt be guided by feeling a Fluctuation; and tho' we do not perhaps evidently perceive it, yet we may be perſuaded there is a Fluid of ſome kind, if we are once aſſured, that the Diſtenſion of the *Tunica Vaginalis* makes the Tumour, which is to be diſtinguiſhed in the following Manner.

If the Inteſtine, or *Omentum*, form the Swelling, they will be ſoft and pliable, (unleſs inflamed) uneven in their Surface, particularly the *Omentum*, and both of them extend themſelves up from the *Scrotum* quite into the very *Abdomen*; whereas, in the *Hydrocele*, the Tumour is tenſe and ſmooth, and ceaſes before, or at its Arrival to the Rings of the abdominal Muſcles; becauſe the upper Extremity of the *Tunica Vaginalis* terminates at ſome Diſtance from the Surface of the Belly.

When

When the Teſticle is increaſed in its Size, the Tumour is rounder, and if not attended with an Enlargement of the ſpermatic Veſſels, the Cord may be eaſily diſtinguiſhed between the Swelling and *Abdomen*; but without this Rule of Diſtinction, either the Pain, or the very great Hardneſs will diſcover it to be a Diſeaſe of the Teſticle.

As to the Cure of this Diſtemper by external Applications, or internal Means: after having tried upon a great variety of Subjects, moſt of the Medicines invented to that end, I have found but very little Satisfaction in the Event; for if by chance, any one has mended under a phyſical Regimen, it muſt be confeſſed too, that there are ſome Inſtances of People recovering, who have ſo abſolutely neglected themſelves as not even to wear a Bag-truſs; on which account, I ſhould judge it adviſeable to wait with Patience 'till the Tumour becomes troubleſome, and then to tap it with a Lancet or Trocar. In opening with a Lancet, it may poſſibly happen, the Orifice of the Skin ſhall ſlip away from that of the Tunick, and prevent the Egreſs of the Water; to obviate which Inconvenience, you may introduce a Probe, and by that means ſecure the exact Situation of the Wound;

but if the Coats are very much thickened, it will be adviſeable to uſe the Trocar, rather than the Lancet. It is ſpoken of as an eaſy thing, to hold the Teſticle with the left Hand, while we make the Puncture with the Right, but when the *Tunica Vaginalis* is very tenſe, it cannot well be diſtinguiſhed: however, I think there is no Danger of wounding it, if you make the Puncture in the inferior Part of the *Scrotum*. During the Evacuation, the *Scrotum* muſt be regularly preſſed; and after the Operation, a little Piece of dry Lint and Sticking-plaiſter are ſufficient.

This Method of Tapping, is called *The palliative Cure*; not but that it does now and then prove an abſolute one. To prevent the Relapſe of this Diſeaſe, Surgeons preſcribe the making a large Wound, either by Inciſion or Cauſtic, that upon healing it afterwards, the Firmneſs and Contraction of the Cicatrix may bind up the relaxed lymphatic Veſſels, and obſtruct the further preternatural Effuſion of their Contents: But by what I have ſeen of this Practice, it is generally attended with ſo much Trouble, that notwithſtanding its Succeſs in the end, I believe whoever reads the following

Caſes

Caſes will be apt to diſcard the Method, and abide rather by the Palliative Cure.

CASE I.

A. B. aged 44. a ſtrong Man, never in his Life having been ſubject to any other Infirmity, put himſelf under my Care for the Relief of a *Hydrocele* on the left Side of the *Scrotum*.

December 3, 1733, I diſcharged the Water, by making an Inciſion thro' the Teguments about four Inches long. Towards Night he grew feveriſh, got no Reſt, the *Scrotum* and Teſticle on that Side, beginning to inflame, and the capillary Arteries (dilating) to bleed freely. He was ſeized too, with a violent Pain in his Back, which was in a great meaſure removed by ſuſpending the *Scrotum* with a Bag-truſs.

From the 3d to the 7th, continued in a moſt dangerous Condition, when the Fever tended to a Criſis, by the Suppuration of both Wound and Teſticle.

From the 7th to the 24th, he daily acquired Strength; but the Diſcharge from the Teſticle increaſing, and the Sinus penetrating now very deep towards the *Septum*

Scroti, I opened the Body of the Teſticle, the whole length of the Abſceſs.

From the 24th, the Diſcharge leſſened ſurpriſingly; ſo that in ſix Days, the Surface of the greateſt part of the Teſticle united with the *Scrotum*, and there remained only a ſuperficial Wound, which was entirely cicatriſed on *Jan.* 10, 1733-4.

March 31, 1737, he continued in perfect Health.

CASE II.

In the Year 1733, I made an Inciſion thro' the *Scrotum* and *Tunica Vaginalis* of a Boy about eight Years of Age, who narrowly eſcaped with his Life: but the ſymptomatic Fever terminating at laſt in an Abſceſs of the *Scrotum*, it proved his Cure, tho' with ſome Trouble, in a few Weeks.

CASE III.

A. C. aged 37, of a very hale Habit of Body, had complained of a Tumour on one Side of the *Scrotum*, which continuing to enlarge for ſix Years he applied to a Surgeon, who laid a ſmall Cauſtic on the upper Part of it, and opening the Eſchar, emptied

emptied near three Pints of Water; but he relapſing ſoon after this, I undertook the abſolute Cure.

December 15, 1736, I laid, on the anterior and upper Part of the *Scrotum*, a Cauſtic about ſix Inches long, and one broad.

December 16, by a ſmall Puncture thro' the Eſchar, I emptied above a Quart of Water.

From the 17th to the 24th, he continued in a great deal of Pain, not only in the Part, but in his Back and Loins, and had very little Reſt; the *Scrotum* on that Side, became exceedingly inflamed and thickened, the ſymptomatic Fever running very high, without any Signs of the Digeſtion of the Wound.

On the 24th at Night he grew a little eaſier, and continued ſo 'till the 29th, when the Slough ſeparated; but the Wound retained ſtill a bad Aſpect, no Granulations appearing on its Surface.

From *Decemb.* 29, to *Jan.* 5, he remained in the ſame State.

From the 5th to the 13th, the Swelling and Pain rather increaſed, and that Night he was ſeized with an Ague-fit, which returned every other Day twice more.

From the 17th to the 26th, the Ague being ſtopt, he began to alter much for the better, two Impoſthumations on the *Scrotum* being in this interim opened.

By *Feb.* 2, the Pain was quite gone, the Tumour very much ſunk, and the Induration ſoftened.

In a very few Days after, the Wound cicatriſed, and on *Feb.* 24, I left him in perfect Health, and free from any Complaint.

Having in the preceding Caſes been ſeemingly threatened with the Death of the Patients, I tried the following Experiment, upon the Reputation of its having been done with Succeſs by others.

CASE IV.

A. D. aged Forty-two, had for near four Years been troubled with a *Hydrocele* on one Side, for which I had tapped him about twelve times, taking away near a Pint of clear Water each Operation.

Jan. 3, 1736-7, after having emptied the *Tunica Vaginalis*, I injected an Ounce of Spirit of Wine; in the Inſtant, he complained of great Pain, which continued to increaſe, and the next Day the Teguments were

were very much augmented in their Bulk and Thickneſs.

Jan. 7. The Tenſion became violently painful, and perceiving a Fluctuation, I made a Puncture, by which he voided about half a Pint of Water, very deeply tinged with Blood, but without any Flavour of the Spirits to be diſtinguiſhed by the Smell: This gave him ſome Eaſe, but the Inflammation and Thickneſs continued a whole Month, and then terminated in two Abſceſſes on the Fore-part of the *Scrotum*, which I opened the 7th of *February* following; and ontheir Diſcharge, the whole Tumour ſubſided, leaving a firm Cicatrix and abſolute Cure of that Diſorder.

Something ſimilar to the Circumſtance of *A. D.*'s bloody Water, is the Caſe of another Perſon who was under my Care: He had at conſiderable Intervals of time been often tapped, diſcharging that ſort of ſerous Water the *Tunica Vaginalis* for the moſt part yields; at laſt, it became tinged with Blood, and every time grew more bloody than the other: The fourth Diſcharge of this kind, was attended with a remarkable Hæmorrhage, and terminated in an abſolute Cure; no Signs of a Relapſe

appearing ſome Months after, as I had an Opportunity to inform myſelf.

To the Caſes above recited, I could add ſtill more that have fallen within my Knowledge, ſince the time I made theſe Obſervations; particularly two, attended with Inflammation and Abſceſs, from the mere Puncture of the Lancet: both of which terminated in an abſolute Cure. It may be remarked however of theſe two, that one was attended with a thickened Tunick, and the Water bloody; and in the other, the Coat was thickened, and the *Epididymis* enlarged and indurated from a former Gonorrhœa.

I would not however be underſtood from this Catalogue of Misfortunes, that the Operation is never performed without much Trouble; ſome Examples I have known in its favour, but by no means enough to warrant the Recommendation of it, unleſs to ſuch Patients who are inconſolable under the Diſtemper, and are willing to ſuſtain any thing for a Cure.

It is worth obſerving, that upon examination of the ſeveral *Hydroceles*, it appeared evidently, their Cure was wrought by an univerſal Adheſion of the Teſticle to the *Tunica Vaginalis*, and again of that Coat to the

the Parts enveloping it; from which Obſervation it will not be difficult to conceive how it happens, that Diſcharges of bloody Water work a Cure; ſiince Inflammations of Membranes almoſt perpetually produce Adheſions of the neighbouring Parts, and theſe Diſcharges are no other than a Mixture of Blood with the Water from the ruptured Veſſels of the inflamed Tunick.

It has been ſuggeſted, that probably the expoſing the *Tunica Vaginalis* to the Air, might occaſion the abovementioned Diſorders; but beſides that the Caſe of the injected *Sp. Vin.* the Caſe of the Cauſtic, and the two Punctures, are ſufficient Anſwers to that Opinion, the Inſtances I have ſeen of the whole *Scrotum* ſeparating in a Gangrene from the *Tunica Vaginalis*, and leaving it naked a great many Days without any ill Effect, put it out of Diſpute, that 'tis the mere Inflammation of the Tunick produces the Danger. I have caſtrated ſeveral Men, whoſe ſcirrhous Teſticles were accompanied with a *Hydrocele*, but the whole *Tunica Vaginalis* being carried off by the Operation, they all recovered without any bad Symptoms. I have here propoſed an Inciſion only thro' the *Tunica Vaginalis*, as the Means to effect a radical Cure; but

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it has been said, that to cut off a large Portion of it, is a more effectual and a less dangerous Operation; this Fact I have lately taken under Consideration, but have not yet had sufficient Experience to form a positive Opinion on the Subject.

I shall finish this Chapter with a further Remark on the supposed Variety of *Hydroceles*. Besides the imaginary one already specified between the *Scrotum* and inferior Membranes, there is mention made of a Species of Dropsy between the *Cremaster Muscle* and *Tunica Vaginalis*: But I judge it more likely to be within side the *Tunica Vaginalis* of the Cord, which adhering in different Places to the spermatic Vessels, may form a Cyst or two between the Adhesions, of which an Instance has fallen under my own Examination. Indeed, if we reflect on the Cause of a Dropsy of this Part, we must necessarily confine it to the Inside of the Membrane, where only is that Order of Vessels which are the Subject of the Disease. The Dropsy of the *Testis* itself, is the last supposed Species, but it is what I have never seen; and from the Analogy of the *Testis*, to the Structure of other Glands, that are not pretended to become Dropsical, I am suspicious there is no such Distemper.

CHAP.

CHAP. X.

Of CASTRATION.

THIS is one of the moſt melancholy Operations in the Practice of Surgery, ſince it ſeldom takes place but in Diſorders into which the Patient is very apt to relapſe, *viz.* thoſe of a Schirrhus, or Cancer; for under moſt of the Symptoms deſcribed as rendering it neceſſary, it is abſolutely improper; ſuch as a *Hydrocele*, Abſceſs of the *Teſtis*, an increaſing Mortification, or what is ſometimes underſtood by a *Sarcocele*; of which laſt it may not be amiſs to ſay a Word. In the utmoſt Latitude of the Meaning of this Term, 'tis received as a fleſhy Swelling of the Teſticle itſelf, called likewiſe *Hernia Carnoſa*; or in ſome Enlargements, ſuch as in a Clap, more frequently *Hernia Humoralis*; but generally ſpeaking, is conſidered as a fleſhy Excreſcence formed on the Body of the *Teſtis*, which becoming exceedingly hard and tumefied, for the moſt part is ſuppoſed to demand Extirpation, either by cutting or burning away the Induration, or amputating the Teſticle: But this Maxim too precipately

cipitately received, has, I apprehend, very much misguided the Practitioners of Surgery.

In order to conceive better of the Distinction I am going to make, it must be remembered, that what is called the Testicle, is really composed of two different Parts; one Glandular, which is the Body of the *Testis* itself; and one Vascular or Membranous, known by the name of *Epididymis*, which is the Beginning of the *Vas Deferens*, or the Collection of the excretory Ducts of the Gland.

Now it sometimes happens that this Part is tumefied, independent of the Testicle; and feeling like a large adventitious Excrescence, answers very well to the Idea most Surgeons form of a *Sarcocele*; but not being aware of the different Nature and Texture of the *Epididymis*, they have frequently confounded its Disorders with those of the Testicle itself, and equally recommended Extirpation in the Induration of one or the other. But without tiring the Reader with particular Histories of Cases relating to this Subject, I shall only say, That from diligent Enquiry I have collected, that all Indurations of the glandular Part of the Testicle not tending to Inflammation and Abscess,

ſeeſs, generally, if not always, lead on to Schirrhus and Cancer; whereas thoſe of the *Epididymis* ſeldom or never do. It is true, in ſpite of internal or external Means, theſe laſt often retain their Hardneſs, and ſometimes ſuppurate, but however, without much Danger in either Caſe.

It will not be hard to account for this Difference of Conſequences, from Tumours of ſeemingly one and the ſame Body, when we reflect how much it is the Nature of cancerous Poiſons to fix upon Glands, and how different the *Epididymis* is from a Gland, tho' ſo nearly in the Neighbourhood of one.

I would not have it ſuppoſed from what I have ſaid, that the *Epididymis* never becomes cancerous; I confeſs it may, ſo may every Part of the human Body: But I advance that it rarely or never is ſo, but from an Affection of the glandular Part of the Teſticle firſt, which indeed ſeldom fails to taint, and by degrees to confound it in ſuch a manner, as to make one Maſs of the two.

Before we caſtrate, it is laid down as a Rule to inquire whether the Patient has any Pain in his Back, and in that caſe to reject the Operation, upon the reaſonable Preſumption of the ſpermatic Veſſels being like-

likewiſe diſeaſed ; but we are not to be too haſty in this Determination ; for the mere weight of the Tumour ſtretching the Cord, will ſometimes create the Complaint. To learn the Cauſe then of this Pain in the Back, when the ſpermatic Cord is not thickened, let your Patient be kept in Bed, and ſuſpend his *Scrotum*, in a Bag-truſs, which will relieve him, if diſordered by the Weight only; but if the ſpermatic Cord is thickened or indurated, which Diſeaſe, when attended with a Dilatation of the Veſſels of the *Scrotum*, is known by the *Greek* Appellations *Circocele* and *Varicocele*, the Caſe is deſperate and not to be undertaken.

But ſuppoſing no Obſtacle in the way to the Operation, the Method of doing it may be this : Lay your Patient on a ſquare Table of about three Feet four Inches high, letting his Legs hang down, which, as well as the reſt of his Body, muſt be held firm by the Aſſiſtants. Then with a Knife, begin your Wound above the Rings of the *Abdominal* Muſcles, that you may have Room afterwards to tie the Veſſels, ſince for want of this Caution, Operators will neceſſarily be embarraſſed in making the Ligature : then carrying it thro' the *Membrana Adipoſa*, it muſt be continued downward,

ward, the Length of it being in proportion to the Size of the Teſticle. If it is very ſmall, it may be diſſected away without taking any part of the *Scrotum*; but I am not very fond of this Method, becauſe ſo much looſe flabby Skin is apt to form Abſceſſes afterwards, and very frequently grow callous. If the Teſticle, for Inſtance, weighs twenty Ounces; having made one Inciſion about five Inches long, a little circularly, begin a ſecond in the ſame Point as the firſt, bringing it with an oppoſite Sweep, to meet the other in the inferior Part, in ſuch a manner as to cut out the Shape of an Oval, whoſe ſmalleſt Diameter ſhall be two Inches: After this, diſſect away the Body of the Tumour with the Piece of Skin on it, from the *Scrotum*, firſt taking up ſome of the Blood-veſſels, if the Hæmorrhage is dangerous. Then paſs a Ligature round the Cord, pretty near the *Abdomen*; and if you have Space between the Ligature and Teſticle, a ſecond about half an Inch lower, to make the Stoppage of Blood ſtill more ſecure. The Ligatures may be tied with what is called the *Surgeon's Knot*, where the Thread is paſſed thro' the Ring twice. This done cut off the Teſticle a little underneath the ſecond Ligature, and

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paſs a Needle from the Skin at the lower Part of the Wound thro' the Skin at the upper Part, in ſuch manner as to envelope in ſome degree the ſound Teſticle, which will greatly facilitate and quicken the Cure; or if one Stitch will not anſwer the Purpoſe, you may repeat it in ſuch Part of the Wound, where the Skin on each Side lies moſt looſe.

The Method I have here deſcribed is what I have moſt frequently practiſed; but I think I have of late Years performed the Operation with more Dexterity, where I have divided the Teſticle from the Cord, before I had diſſected away the Skin from the Body of the Teſticle; for having had by this means an Opportunity of laying hold of its upper Part, I could ſeparate it from the *Scrotum* with much more Eaſe, than without that Advantage.

I once caſtrated a Man whoſe Teſticle weighed above three Pounds, where ſome of the Veſſels were ſo exceedingly varicous and dilated, as nearly to equal the ſize of the Humeral Artery; however, I took up two or three of the moſt conſiderable, and purſued the Operation, cutting away near three fourths of the Skin, by which means I avoided a dangerous Effuſion, as by di-

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viding the Veſſels before they were much rameſied, I had fewer Ligatures to make: The Succeſs anſwered the Deſign, and the Patient ſurvived the Operation and healing of the Wound; but the cancerous Humour falling on his Liver ſome time after, deſtroyed him. In large Tumours, ſuch as the laſt I have mentioned, it is adviſeable to cut away great part of the Skin; for beſides that the Hæmorrhage will be much leſs in this Caſe, and the Operation greatly ſhortened; the Skin by the great Diſtenſion having been rendered very thin, will great part of it, if not taken away, ſphacelate, and the reſt be more prone to degenerate into a cancerous Ulcer.

It may be obſerved, I do not, in order to avoid wounding the Spermatic Veſſels, recommend pinching up the Skin before the Inciſion, and afterwards thruſting the Fingers between the *Membrana Cellularis* and the Teſticle to tear the one from the other; the firſt is not dextrous; and the other is painful; and both of them, in my Opinion, are calculated to prevent what there is little or no danger of.

CHAP. XI.

Of the PHYMOSIS.

THE *Phymosis* signifies no more than such a Straitness of the Prepuce, that the Glans cannot be denuded; which if it becomes troublesome so as to prevent the Egress of the Urine, or conceal under it Chancres or foul Ulcers, quite out of the Reach of Application, is to be cut open. It sometimes happens, that Children are born imperforate; in which Case, a small Puncture, dressed afterwards with a Tent, effects a Cure: but this Operation is chiefly practised in venereal Cases, in order to expose Chancres, either on the Glans or withinside the Prepuce itself: And here, if the Prepuce is not very callous and thick, a mere Incision will answer; which may be made either with the Scissars, or by slipping a Knife between the Skin and Glans to the very Extremity, and cutting it up: The last Method is more easy than that of the Scissars, but it is safer to make the Wound on one Side the Prepuce than upon the upper Part, for I have sometimes seen the great Vessels on the *Dorsum Penis* afford

ford a terrible Hæmorrhage, which may be avoided by following this Rule; tho' the Prepuce remains better ſhaped after an Inciſion made in the upper Part, and therefore is to be prefered by thoſe who underſtand how to take up the Veſſels. In Children it ſometimes happens that the Prepuce becomes very much contracted; and in that Caſe, it is accidently ſubject to ſlight Inflammations, which bring on ſome Symptoms of the Stone: but the Diſorder is always removed by the Cure of the *Phymoſis*.

If the Prepuce be very large and indurated, the Opening alone will not ſuffice, and it is more adviſeable to take away the Calloſity by Circumciſion, which muſt be performed with a Knife; and if the Artery bleed much, it muſt be taken up with a ſmall Needle and Ligature: It may be worth remarking here, that in certain *Phymoſes*, the Prepuce becomes ſo thickened, and at the ſame time ſo elongated, that it reſembles the Body of the *Penis*, and has led ſome into the Miſtake of ſuppoſing they had cut off a Portion of the *Penis* itſelf, when it was only a monſtrous *Phymoſis*.

CHAP. XII.

Of the PARAPHYMOSIS.

THE *Paraphymoſis* is a Diſeaſe of the *Penis*, where the Prepuce is fallen back from the Glans, and cannot be brought forwards to cover it: There are many, whoſe *Penis* is naturally thus formed, but without any Inconvenience; ſo that ſince the time of the *Romans* (ſome of whom thought it indecent to have the Glans bare) it has not been uſual, as I can find, to perform any Operation upon that Account; but we read the ſeveral Proceſſes of it deſcribed very particularly by *Celſus*, who does not ſpeak of it as an uncommon thing. Moſt of the Inſtances of this Diſtemper, are owing to a venereal Cauſe: but there are ſome, where the Prepuce is naturally very tight, which take their riſe from a ſudden Retraction of it, and immediate Inlargement of the Glans preventing its Return. Sometimes it happens that the Surgeon ſucceeds in the Reduction immediately, by compreſſing the Extremity of the *Penis*, at the time he is endeavouring to advance the Prepuce; if he does not, let him keep

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it ſuſpended, and attempt again, after having fomented, and uſed ſome emollient Applications: But if, from the Contraction below the *Corona Glandis*, there is ſo great a Stricture as to threaten a Gangrene, or even, if the *Penis* is much inlarged by Water in the *Membrana Reticularis*, forming Tumours, called *Cryſtallines*, three or four ſmall Inciſions muſt be made with the point of a Lancet, into the Stricture and *Cryſtallines*, according to the Direction of the *Penis*; which in the firſt Caſe will ſet free the Obſtruction, and in the other evacuate the Water: The manner of dreſſing afterwards muſt be with Fomentations, Digeſtives, and the *Theriaca Londinenſis* over the Pledgits.

CHAP. XIII.

Of the PARACENTESIS.

THIS Operation is an Opening made into the *Abdomen*, in order to empty any Quantity of extravaſated Water, collected in that Species of Dropſy called the *Aſcites*; but as there is much more Difficulty in learning when to perform than how to perform it, and indeeed in ſome Inſtances re-

requires the niceſt Judgment; I ſhall endeavour to ſpecify the Diſtinctions which render the Undertaking more or leſs proper.

There are but two kinds of Dropſy; the *Anaſarca*, called alſo *Leucophlegmacy*, when the extravaſated Water ſwims in the Cells of the *Membrana Adipoſa*: and the *Aſcites*, when the Water poſſeſſes the Cavity of the *Abdomen:* In the firſt kind, the Water is clear and limpid, but in the ſecond, a little groſſer, very often gelatinous and corrupted, and ſometimes even mixed with fleſhy Concretions. I do not mention the *Tympany* or flatulent Dropſy of the *Abdomen*; nor have I in the Chapter of *Hernias* ſpoke of the *Hernia Ventoſa*, it being certain that the *Aſcites* and *Bubonocele*, have generally been miſtaken for thoſe Diſeaſes; tho' there are ſome few Inſtances where an enormous Tumour of the *Abdomen*, ariſes from exceſſive Flatulencies, and Diſtenſions of the Inteſtines.

It is of no great Conſequence in the Practice of Phyſick or Surgery, whether the Water is diſcharged by a Rupture of the Lymphaticks, or a Tranſudation thro' the Pores of their relaxed Coats, ſince the Fact is eſtabliſhed, that they have a Power ſometimes of abſorbing the Fluid, lying thus looſe,

loose, and conveying it into the Course of the Circulation; after which, it is often totally carried off, by some Emunctory of the Body. The great Disposition there is in Nature, to fix upon the Kidneys and Glands of the Intestines for this End, has put Physicians upon promoting it by Catharticks and Diureticks, which sometimes entirely carry off the Distemper. If any one should doubt of the possibility of a Cure when the Water is extravasated, let him inject thro' a small Opening into the *Thorax* or *Abdomen* of a Dog, a Pint of warm Water, and upon Dissection some few Hours after, he shall not find one Drop left there; which puts out of Dispute this power of Absorption: But indeed, tho' we do not much attend to it, 'tis by this very Act, the Circulation is carried on regularly, with respect to some if not all the Secretions, which would overload their Receptacles, if they were not thus taken up again. The Example serving for Illustration, may be the Circulation of the aqueous Humour of the Eye, which no one questions, is an extravased Fluid.

The Operation of Tapping, is seldom the Cure of the Distemper; but Dropsies, which are the Consequence of a mere Impoverishment of the Blood, are less likely to

return than thoſe which are owing to any previous Diſorder of the Liver; and it is not uncommon for Dropſies that follow Agues, Hæmorrhages, and Diarrhœas, to do well; whereas in ſuch as are complicated with a ſcirrhous Liver, there is hardly an Example of a Cure.

The Water floating in the Belly, is by its Fluctuation to determine, whether the Operation be adviſeable; for if by laying one Hand on any Part of the *Abdomen*, you cannot feel an Undulation from ſtriking on an oppoſite Part, with the other, it is to be preſumed there will be ſome Obſtacle to the Evacuation. It ſometimes happens, that a great Quantity, or almoſt all the Water, is contained in little Bladders, adhering to the Liver and the Surface of the *Peritonæum*, known by the Name of *Hydatids*, and the reſt of it in different ſized ones, from the degree of a *Hydatid*, to the Size of a Globe holding half a Pint, or a Pint of Water. This is called the Encyſted Dropſy, and from the Smallneſs of its Cyſts, makes the Operation uſeleſs, but is not difficult to be diſtinguiſhed, becauſe there is not a Fluctuation of the Water, unleſs it is complicated with an Extravaſation.

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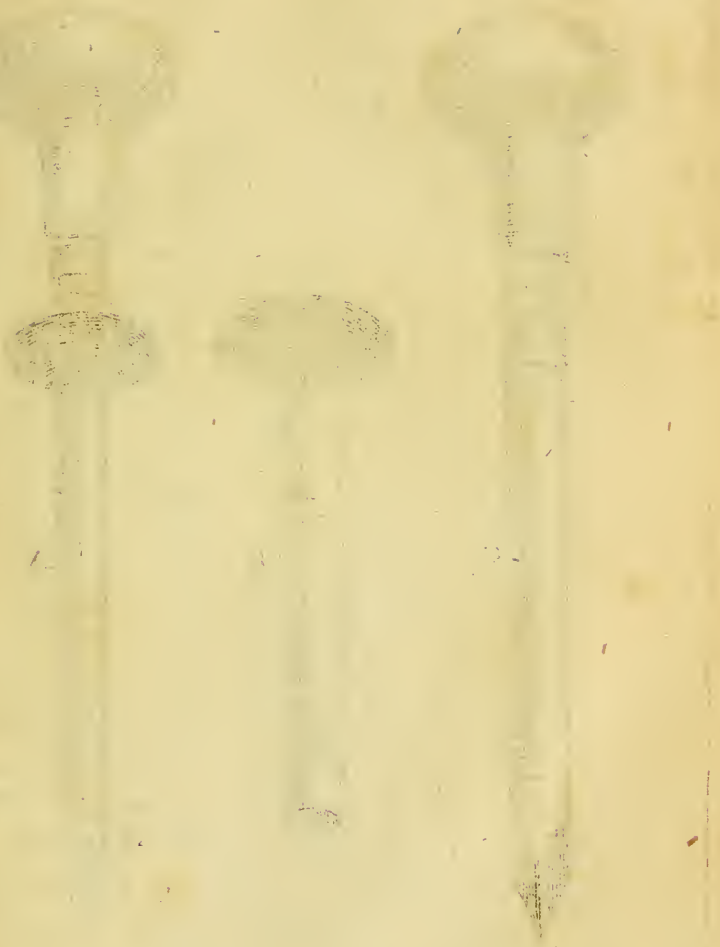

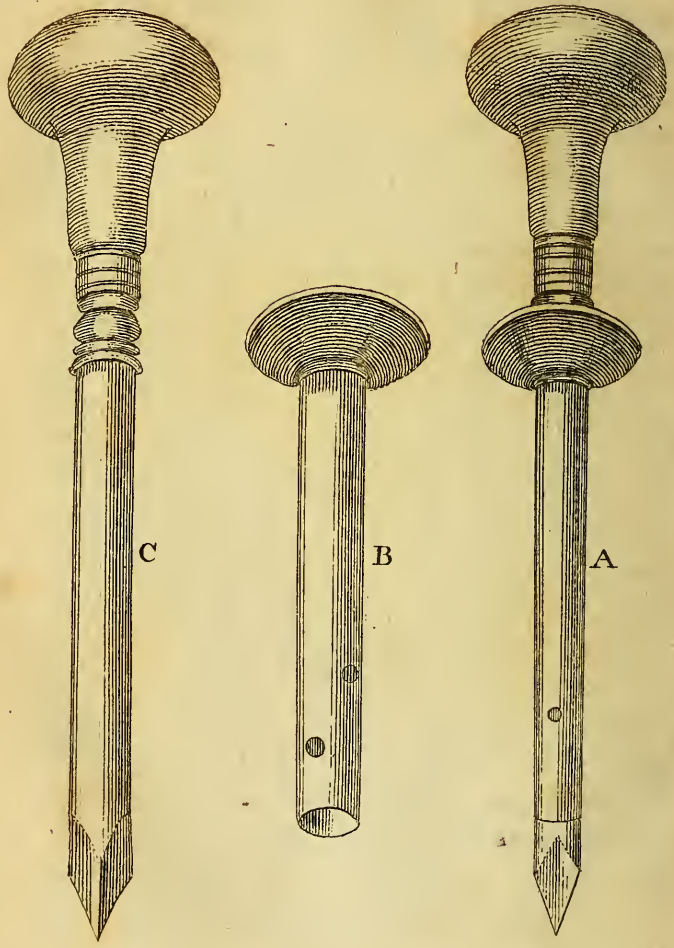
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When the Fluctuation is hardly perceptible, (except the Teguments of the *Abdomen* are very much thickened by an *Anasarca*) in all probability, the Fluid is gelatinous: I have had Inſtances, where it was too viſcid to paſs thro' a common Trocar; on which account it is proper to be furniſhed with a couple, of the Size deſcribed in the Copper-plate. I once tapped a Perſon when the Fluid would not paſs even thro' the large one; ſo to eaſe him from the Diſtenſion he laboured under, I dilated the Orifice with a large Sponge-tent, and afterwards extracted a prodigious Quantity of diſtinct concreted *Hydatids*, differing in nothing, as I could diſcover, from the nature of a *Polypus* formed in the Noſe.

There is another kind of Dropſy, which for the moſt part forbids the Operation, and is peculiar to Women, being ſeated in the Body of one or both Ovaries. There is, I believe, no Example of this Species but what we may be known by the Hardneſs and Irregularity of the Tumour of the *Abdomen*, which is nearly uniform in the other Caſes.

When the Ovary is dropſical, the Water is generally depoſited in a great number of Cells formed in the Body of it, which Circumſtance makes the Fluctuation inſenſible, and

and the Perforation uſeleſs; tho' ſometimes there are only one or two Cells, in which caſe, if the Ovary is greatly magnified, the Undulation will be readily felt, and the Operation be adviſeable. I once tapped a Gentlewoman in this Circumſtance, whoſe Ovary upon the Puncture yielded but half a Pint of Water, but being ſtill perſuaded by the Feel, that there was a large Cyſt, I tapped her in another Part, and drew away near a Gallon: I had an Opportunity after her Death, to be convinced of this Fact, by examining the Body.

When the *Aſcites* and *Anaſarca* are complicated, it is ſeldom proper to perform the Operation, ſince the Water may be much more effectually evacuated by Scarifications in the Legs, than by Tapping.

Upon the Suppoſition nothing forbids the Extraction of the Water, the Manner of Operating is this: Having placed the Patient in a Chair of a convenient Height, let him join his Hands ſo as to preſs upon his Stomach: then dipping the Trocar in Oil, you ſtab it ſuddenly through the Teguments, and withdrawing the Perforator, leave the Waters to empty by the Canula: the *Abdomen* being, when filled, in the circumſtance of a Bladder diſtended with a Fluid,

Fluid, would make it indifferent where to wound; but the Apprehenſion of hurting the Liver, if it be much enlarged, has induced Operators rather to chooſe the left ſide, and generally in that Part, which is about three Inches obliquely below the Navel: If the Navel protuberates, you may make a ſmall Puncture with a Lancet, through the Skin, and the Waters will be readily voided by that Orifice, without any danger of a *Hernia* ſucceeding, as is apprehended by many Writers; though it ſhould be carefully attended to, whether the Protuberance is formed by the Water or an *Exomphalos*, in which latter Caſe the Inteſtine would be wounded, and not without the greateſt danger. The Surgeon neither in opening with the Lancet, nor perforating with the Trocar, need fear injuring the Inteſtines, unleſs there is but little Water in the *Abdomen*, ſince they are too much confined by the Meſentery, to come within reach of Danger from theſe Inſtruments; but it ſometimes happens, that when the Water is almoſt all emptied, it is ſuddenly ſtopped by the Inteſtine or *Omentum* preſſing againſt the end of the Canula; in which caſe you may puſh them away with a Probe: During the Evacuation, your Aſſiſtants muſt

keep

keep preſſing on each ſide of the *Abdomen*, with a Force equal to that of the Waters before contained there; for by neglecting this Rule, the Patient will be apt to fall into Faintings, from the Weight on the great Veſſels of the *Abdomen* being taken off, and the ſinking of the Diaphragm ſucceeding; in conſequence of which, more Blood flowing into the inferior Veſſels than uſual, leaves the ſuperior ones of a ſudden too empty, and thus interrupts the regular Progreſs of the Circulation. To obviate this Inconvenience, the Compreſſion muſt not only be made with the Hands during the Operation, but be afterwards continued, by ſwathing the *Abdomen* with a Roller of Flannel, about eight Yards long, and five Inches broad, beginning at the bottom of the Belly, ſo that the Inteſtines may be born up againſt the Diaphragm: You may change the Roller every Day, 'till the third or fourth Day, by which time, the ſeveral Parts will have acquired their due Tone. For the Dreſſing, a piece of dry Lint and Plaiſter ſuffice; but between the Skin and Roller it may be proper to lay a double Flannel a Foot ſquare, dipt in Brandy or Spirits of Wine.

This

This Operation, though it does not often abſolutely cure, yet it ſometimes preſerves Life a great many Years, and even a pleaſant one, eſpecially if the Waters have been long collecting. I have known ſeveral Inſtances of People being tapped once a Month, for many Years, who felt no Diſorder in the Intervals, 'till towards the time of the Operation, when the Diſtenſion grew painful; and there are Inſtances, where the Patient has not relapſed after it. Upon the whole, there is ſo little Pain or Danger in the Operation, that in conſideration of the great Benefits ſometimes received from it, I cannot but recommend it as exceedingly uſeful.

PLATE III.

The EXPLANATION.

A. A Trocar of the moſt convenient ſize for emptying the *Abdomen*, when the Water is not gelatinous. It is here repreſented with the Perforator in the Canula, juſt as it is placed when we perform the Operation.

B. The Canula of a large Trocar, which I have recommended in Caſes where the Water is gelatinous.

C. The Perforator of the large Trocar.

The Handle of the Trocar, is generally made

made of Wood, the Canula of Silver, and the Perforator of Steel; great care ſhould be taken by the Makers of this Intrument, that the Perforator ſhould exactly fill up the Cavity of the Canula; for unleſs the Extremity of the Canula lies quite cloſe and ſmooth on the Perforator, the Introduction of it into the *Abdomen* will be very painful: To make it ſlip in more eaſily, the Edge of the Extremity of the Canula ſhould be thin and ſharp; and I would recommend, that the Canula be Steel, for the Silver one being of too ſoft a Metal becomes jagged or bruiſed at its Extremity with very little uſe. After the Operation, the Canula muſt be wiped clean and dry, by drawing a Slip or two of Flannel thro' it; otherwiſe, when the Perforator is put into it, they will both grow ruſty.

CHAP. XIV.

Of the FISTULA IN ANO.

THE *Fiſtula in Ano*, without any regard to the ſtrict Definition of the Word, is generally underſtood to be an Abſceſs, running upon, or into the *Inteſtinum Rectum*; though an Abſceſs in this Part, when once ruptured, does generally, if neglected

lected, grow callous in its Cavity and Edges, and become at last, what is properly called a *Fistula*.

That the *Anus* is so often exposed to this Malady, in any Crisis of the Constitution, is chiefly ascribed to the depending Situation of the Part; but what very much conduce to it likewise, are the great quantities of Fat surrounding the *Rectum*, and the Pressure the Hæmorrhoidal Vessels are liable to, which being sustained upon very loose Membranes, will be less able to resist any Effort, that Nature shall exert, to fling off a Surcharge; and from one Step to another, that is, from Inflammation to Suppuration, lead on to the Distemper we are treating of. That the Fat is the proper Subject of Abscesses, may be learned from an Inflammation of the Skin affecting the *Membrana Adiposa*, and producing Matter there; in which Case, a Suppuration frequently runs from Cell to Cell, and in a few days, lays bare a great quantity of Flesh underneath, without affecting the Flesh itself: Nay, I think it may be doubted, whether in those Abscesses which are esteemed Suppurations of the Muscles, the Inflammation and Matter are not absolutely first formed in this Mem-

Membrane, where it is inſinuated in the Interſtices of their Fibres.

The Piles, which are little Tumours formed about the Verge of the *Anus*, immediately within the *Membrana interna* of the *Rectum*, do ſometimes ſuppurate, and become the Fore-runners of a large Abſceſs; alſo external Injuries here, as in every other part of the Body, may produce it; but from whatever Cauſe the Abſceſs ariſe, the manner of operating upon it, will be according to the Nature and Direction of its Cavity.

If the Surgeon have the firſt Management of the Abſceſs, and there appear an external Inflammation upon one ſide of the Buttock only; after having waited for the proper Maturity, let him with a Knife make an Inciſion the whole length of it; and in all probability, even though the Bladder be affected, the Largeneſs of the Wound, and the proper Application of Doſſils lightly preſſed in, will prevent the Putrefaction of the Inteſtine, and make the Cavity fill up like Impoſthumations of other Parts.

If the *Sinus* be continued to the other Buttock, almoſt ſurrounding the Inteſtine; the whole Courſe of it muſt be dilated in like

like manner; ſince in ſuch ſpongy Cavities, a Generation of Fleſh cannot be procured but by large Openings; whence alſo, if the Skin is very thin, lying looſe and flabby over the *Sinus*, it is abſolutely neceſſary to cut it quite away, or the Patient will be apt to ſink under the Diſcharge, which in the Circumſtance here deſcribed, is ſometimes exceſſive. By this Method, which cannot be too much recommended, it is amazing how happy the Event is likely to be; whereas from neglecting it, and truſting only to a narrow Opening, if the Diſcharge do not deſtroy the Patient, at leaſt the Matter, by being confined, corrupts the Gut, and inſinuating itſelf about it, forms many other Channels, which running in various Directions, often baffle an Operator, and have been the cauſe of a Fiſtula being ſo generally eſteemed very difficult of Cure.

Here I have conſidered the Impoſthumation as poſſeſſing a great part of the Buttock; but it more frequently happens, that the Matter points with a ſmall extent of Inflammation on the Skin, and the Direction of the *Sinus* is even with the Gut: In this caſe, having made a Puncture, you may with a Probe learn if it has penetrated into the Inteſtine, by paſſing your Finger up

it, and feeling the Probe introduced through the Wound into its Cavity; though for the moſt part, it may be known by a Diſcharge of Matter from the *Anus*. When this is the ſtate of the Fiſtula, there is no Heſitation to be made; but immediately putting one Blade of the Sciſſars up the Gut, and the other up the Wound, ſnip the whole length of it. This Proceſs is as adviſeable, when the Inteſtine is not perforated, if the *Sinus* is narrow, and runs upon or very near it; for if the Abſceſs be tented, which is the only way of dreſſing it while the external Orifice is ſmall, as I have here ſuppoſed, it will almoſt certainly grow callous; ſo that the ſureſt means of Cure, will be opening the Gut, that proper Applications may be laid to the Bottom of the Wound. However it ſhould be well attended to, that ſome *Sinuſes* pretty near the inteſtine, neither run into nor upon it, in which caſe they muſt be opened, according to the courſe of their Penetration. There are abundance of Inſtances, where the Inteſtine is ſo much ulcerated, as to give free iſſue to the Matter of the Abſceſs by the *Anus*; but I believe there are none where there is not by the Thinneſs and Diſcolouration of the Skin, or an Induration to be perceived thro' the Skin,

ſome

ſome mark of its Direction; which, if diſcovered, may be opened into with a Lancet, and then it becomes the ſame Caſe as if the Matter had fairly pointed.

If the *Sinuſes* into, and about the Gut, are not complicated with an Induration, and you can follow their Courſe; the mere opening with Sciſſars, or a Knife guided on a Director, will ſometimes ſuffice; but it is generally ſafer to cut the piece of Fleſh ſurrounded by theſe Inciſions, quite away, and when it is callous abſolutely neceſſary, or the Calloſities muſt be waſted afterwards by Eſcharotick Medicines, which is a tedious and cruel Method of Cure.

When the Fiſtula is of long ſtanding, and we have choice of Time for opening it, a Doſe of Rhubarb the Day before the Operation will be very convenient, as it not only will empty the Bowels, but alſo prove an Aſtringent for a while, and prevent the Miſchief of removing the Dreſſings in order to go to ſtool.

It ſometimes happens that the Orifices are ſo ſmall, as not to admit the Entrance of the Sciſſars; in which caſe, Sponge-tents muſt be employed for their Dilatation.

In performing theſe Operations on the *Anus*, I do not think, in general any In-

ſtrument ſo handy as the Knife and Sciſſars; almoſt all the others which have been invented to facilitate the Work, are not only difficult to manage, but more painful to the Patient: However, in thoſe Inſtances where the Fiſtula is very narrow, and opens into the Inteſtines, juſt within the Verge of the *Anus*, the Syringotomy may be uſed with Advantage: But where the Opening into the Gut is high, it cannot be employed without giving great Pain. I do not caution againſt cutting the whole Length of the Sphincter, Experience having ſhewn it may be done with little Danger of an Incontinence of Excrement; and in fact the Muſcle is ſo ſhort, that it muſt generally be cut through in Dilatations of the Inteſtine.

The worſt Species of Fiſtula, is that communicating with the *Urethra*, and ſometimes (thro' the Proſtate Gland) with the Bladder itſelf. This generally takes its riſe from a former Gonorrhœa, and appears externally firſt in *Pærineo*, and afterwards increaſing more towards the *Anus*, and even ſometimes into the Groin, burſts out in various Orifices, thro' the Skin, which ſoon becomes callous and rotten; and the Urine paſſing partly thro' theſe Orifices, will often excite as much Pain, and of the ſame kind, as a Stone in the Bladder.

This Species of Fiſtula taking its riſe from Strictures of the Urethra, is only manageable by the Bougie: for ſo long as the *Urethra* is obſtructed, the Cure of the Fiſtula will be imperfect; but if the Canal be opened by this Application, it is amazing what obſtinate Indurations and foul *Sinuſes* will in conſequence diſappear; tho' there are ſome ſo callous and rotten, as to demand the Kniſe and ſkilful Dreſſings, notwithſtanding the *Urethra* ſhould be dilated by the uſe of Bougies.

CHAP. XV.

Of the Puncture *of the* PÆRINEUM.

THIS Operation is performed, when the Bladder is under ſuch a Suppreſſion of Urine, as cannot be relieved by any gentler Methods, nor by reaſon of the Obſtruction in its Neck, or the *Urethra* will admit of the Introduction of the Catheter. The manner of doing it, as deſcribed by moſt Writers, is by puſhing a common Trocar from the Place where the external Wound in the old way of cutting is made, into the Cavity of the Bladder, and ſo procuring the Iſſue of the Water through the

Canula; but others, refining upon this Practice, have ordered an Inciſion to be carried on from the ſame Part into the Bladder, and then to inſinuate the Canula: But in my Opinion, both the Methods are to be rejected, in favour of an Opening a little above the *Os Pubis:* For beſides, that it is not eaſy to guide the Inſtrument thro' the proſtate Gland into the Bladder, the Neceſſity of continuing it, in a Part already very much inflamed and thickened, ſeldom fails to do Miſchief, and even to produce a Mortification.

Some time ſince, a Gentlewoman complained of a Difficulty in making Water, which ſhe voided by Drops with exceſſive Pain; and ſoon after, the urinary Paſſage became totally obſtructed. Having in vain attempted to paſs the ſmalleſt Catheter I could get, I introduced my Finger into the *Vagina*, and felt a very hard Tumour about the neck of the Bladder: The Patient had not voided any Water for five Days, and being in the utmoſt Agony, and as we judged within a few Hours of dying, I put in practice the Inciſion above the *Os Pubis*, making the Wound of the Skin about two Inches long, and that of the Bladder about half an Inch; Having emptied by

by this Means, a prodigious quantity of Water, I kept the Orifice open with a hollow Tent, 'till ſuch time as the Tumour ſubſided, which, with proper Medicines, it did by degrees; and in about ſix Weeks, all her Water came to the right Way, and ſome time after, ſhe recovered perfect Health. I have lately practiſed a Method ſtill more eaſy both to the Patient and the Operator; which conſiſts only in emptying the Bladder with a common Trocar, and ſtopping the Canula with a little Cork, which is afterwards to be taken out, as often as the Patient has occaſion to urine. The Canula is to be continued in the Bladder, till ſuch time as the Perſion finds he can void his Urine by the Natural Paſſage.

In this Operation the *Abdomen* ought to be perforated about two Inches above the *Os Pubis*; and if the Patient be fat, the Trocar ſhould penetrate two Inches, otherwiſe, an Inch and a half will be ſufficient; this Precaution is of ſo great Importance, for I have ſeen an Example, where the Trocar being introduced nearer to the *Os Pubis*, the Extremity of it preſſed upon the lower Portion of the Bladder, and in a few Days made a Paſſage into the *Rectum*.

CHAP. XVI.

Of the STONE.

STONY Concretions are a Diſeaſe, incident to ſeveral Parts of the Body; but I ſhall treat only of thoſe formed in the Kidneys and Bladder: Hitherto there has never been given any ſatisfactory Account of the Cauſes of this concreting Diſpoſition in the Fluids; and tho' there may be ſome Propriety in conſidering the Sand of Urine, in the ſame light as the Tartar of Wine, from their Similitude in ſeveral Experiments, yet we cannot infer from thence, what does immediately produce it; at leaſt, it is not with any Certainty to be imputed to a particular Diet or Climate, which however are the Cauſes commonly aſſigned; ſince we ſee that in all Countries, and amongſt all Ranks of People, as much among the Sober, as the Luxurious, the Stone is a frequent Diſtemper; and though the great Numbers cut at the Hoſpitals of *Paris*, where the Water of the *Sein* is ſo remarkable for its quantity of Stone, ſeems to favour the Opinion of its being generated by particular Fluids received into the Blood; yet I believe, upon enquiry, this famous Inſtance will not appear concluſive; ſince moſt

moſt of thoſe Patients come from the Provinces, or diſtant Villages, where that Water is not drunk; and as to the Inhabitants of *Paris* itſelf, by what I was able to learn of the Surgeons there, the number of thoſe afflicted with the Stone amongſt them, is pretty nearly in the ſame proportion as in *London*: From which Conſiderations, and the circumſtance of ſo many more Children having the Stone than Men, one would be inclined to think, the Diſpoſition is much oftener born with us, than acquired by any external means. I once ſaw a Stone, in the Kidney of a Fœtus, at the Term of ſeven Months growth, which, had it lived, was two Months before it would have been born.

It is certain the Urine generally abounds with matter proper to compoſe a Stone, and perhaps if it could grow cold in the Bladder, it would always depoſite the Matter there, as it does on the Sides of the Chamber-pot, tho' the Coats of the Bladder being covered with a Mucilage, makes them more unfit than the Sides of the Pot, to attract the ſtony Particles; but we ſee, when once a hard Body is inſinuated into the Bladder, it ſeldom fails to become the Nucleus of a Stone, whether it be a large Piece of Gravel, a Needle, a Bullet, or any other firm

firm extraneous Subſtance, even grumous Blood.

From the monſtrous Increaſe of ſome Stones in a ſmall time, and the Ceſſation of Growth, for many Years, of others, we may be perſuaded that the Conſtitution varies exceedingly at different times, with regard to theſe ſtony Separations; and from the Appearances of moſt Stones, when artfully ſawed through, we may gather, that this Variation of Conſtitution does not ſhew itſelf only in the Quantity of Gravel added to the Stone, but the Quality of it alſo; ſo that a red uniform Stone of an Inch diameter, may perhaps at half that Size, have been a ſmooth white one; at a quarter, a brown Mulberry one; and ſo on, at different times, altering in its Species. Hence (from the Appoſition of differently coloured Gravel,) ariſes for the moſt part, the laminated Appearance of a Stone; tho' ſometimes the *Laminæ* are very nearly of the ſame Colour and Compoſition; and in this Caſe, their Formation ſeems to be owing to the want of Accretion in the Stone for a certain Time, during which, its Surface, by rubbing againſt the Coats of the Bladder, and its Attrition from the Stream of Urine, becomes ſmooth and compact; ſo that

that when more freſh looſe Gravel adheres to it, its different Denſity in that Part, will neceſſarily make the Streaks we ſee in a Section of the Stone, which are only the external Surfaces of each *Lamina*.

That the ceaſing to grow, gives them this laminated Form, and not any particular Diſpoſition in Sand to ſhoot into ſuch a Shape, is probable from the Examination of ſome other Stones, in which a great Quantity of Gravel is firſt collected without any Nucleus, into a ſpongy uniform Maſs, and after that, is covered with ſeveral *Laminæ*.

It is no wonder that Stones ſo generally form in the Kidneys, ſince the Diſpoſition of the Urine will naturally ſhew itſelf as ſoon as it is ſeparated into the *Pelvis*, that is, the ſtony Particles having as ſtrong an Endeavour to unite with one another in the Kidneys as the Bladder, will conſequently, from meeting firſt there, generally produce Gravel and Stone in that Part; nay, I have found by opening the Kidneys of calculous People, that Stone is formed even earlier than I have here ſuggeſted, for in them the *Tubuli Belliniani* were full of Gravel.

Small Stones and Gravel, are frequently voided without Pain; but ſometimes they collect and become very large in the Kidneys;

neys; in which caſe, a Fit of the Stone in that Part, is the Cure, from the Inflammation and Pain occaſioning convulſive Twitches, which at laſt expel them: But in this Diſeaſe, the Patient is very much relieved by ſeveral kinds of Remedies, ſuch as the mucilaginous, the ſaponaceous, *&c.* ſome of which lubricate, and others both lubricate and ſtimulate. The Sand in paſſing through the *Ureters*, is very much forwarded by the Force of the Urine, which is ſo conſiderable, that I have ſeen a Stone that was obſtructed in the *Ureter* in its firſt Formation, perforated quite through its whole Length, and form a large Channel for the Stream of Urine. The *Ureters* being very narrow, as they run over the *Pſoas* Muſcle, and alſo at their Entrance into the Bladder, make the Movement of the Stone very painful and difficult in thoſe Parts; but there is ſeldom ſo much trouble after the firſt Fit; for when once they have been dilated, they generally continue ſo: I have often ſeen them as big as a Man's Finger, but they have been found much larger.

When once a Stone has acquired a moderate Size in the Bladder, it uſually occaſions the following Complaints: Frequent Inclination to make Water, exceſſive Pain in

in voiding it Drop by Drop, and ſometimes a ſudden Stoppage of it if diſcharged in a Stream; after urining, great Torture in the *Glans Penis*, which laſts one, two, or three Minutes, and in moſt Conſtitutions, the violent Straining makes the *Rectum* contract, and expel its Excrements, or if it be empty, occaſions a *Teneſmus*, which is ſometimes accompanied with a *Prolapſus Ani*: The Urine is often tinctured with Blood from a Rupture of the Veſſels, and ſometimes pure Blood itſelf is diſcharged; ſometimes the Urine is very clear, but frequently there are great Quantities of ſlimy Sediment depoſited at the Bottom of it, which is no other than a preternatural Separation of the Mucilage of the Bladder, but has been often miſtaken for *Pus*; whence has ariſen an Opinion, that Ulcers of the Bladder are common, tho' in fact the Diſtemper is very are.

Theſe are the Symptoms of the Stone in the Bladder; yet by no means are they infallible; ſince a Stone in the *Ureter* or Kidneys, or an Inflammation of the Bladder from any other Cauſe, will ſometimes produce the ſame Effects: but if the Patient cannot urine, except in a certain Poſture, 'tis almoſt a ſure Sign the Orifice is obſtructed.

ſtructed by a Stone; if he finds Eaſe by preſſing againſt the *Perinæum* with his Fingers or ſitting with that Part upon a hard Body, there is little Doubt to be made that the Eaſe is procured by taking off the weight of the Stone; or laſtly, if with moſt of theſe Complaints, he thinks he can feel it roll in his Bladder, it is hardly poſſible to be miſtaken; however, the only ſure Judgment to be formed, is from ſearching.

That we ſhould not readily diſtinguiſh the Complaints of the Stone, from many other Affections of the Bladder, is not very ſurpriſing, when we reflect that a Fit of the Stone is nothing but an Inflammation of its Coats, which tho' it be excited by the Stone, requires a Diſpoſition in the Blood to produce it; for if the Complaints in a Fit, were owing to the immediate Irritation of the Bladder, it ſhould follow that the Stone being always the ſame, the Fit would be continual; but beſides that all Patients have conſiderable Intervals of Eaſe (often of many Months) except in thoſe Caſes where the Stone is either very large or pointed, there are Inſtances of ſome few happy Conſtitutions, where they have no Pain, even after having, for a certain time, ſuffered very much.

To

To prevent the Violence, and frequent Returns of the Fits of the Stone, Bleeding and gentle Purging with Manna, are beneficial; abſtaining alſo from Malt-liquors, and Exceſs of Eating and Drinking, is very ſerviceable; but the Milk-Diet and Honey are the greateſt Preventives, not only of Inflammation, but perhaps ſometimes too, of the farther Accretion of the Stone.

From conſidering the Diſorders of the Stone in this light, and the frequent Intervals of Eaſe which happen without the Aſſiſtance of Medicine, we cannot wonder that ſo many Patients have believed the Stone diſſolved, when they have been under any particular Regimen: and that in all Ages there have been many People deceived for a length of Time, by a ſuppoſed Diſſolvent, tho' we have not hitherto known any ſafe one, till lately that Lime and Soap have been diſcovered to have ſometimes that Effect.

CHAP. XVII.

Of SEARCHING.

THE Patient being laid on a horizontal Table, with his Thighs elevated and a little extended, paſs the Sound with the con-

concave Part towards you, 'till it meets with ſome reſiſtance *in Perinæo*, a little above the *Anus*; then turning it without much Force, puſh it gently on into the Bladder; and if it meets with an Obſtruction at the Neck, raiſe its Extremity upwards, by inclining the Handle of it towards you; or if it don't then ſlip in, withdraw it a quarter of an Inch, and introducing your Forefinger into the *Rectum*, lift it up, and it will ſeldom fail to enter: There is ſome Art in turning the Sound in the proper Place of the *Urethra*, which Surgeons not verſed in this Operation cannot ſo well execute; therefore they may paſs the Inſtrument with the concave Side always towards the *Abdomen* of the Patient, obſerving the ſame Rule at the Entrance into the Bladder, as in the other Method. The Cauſe of this Obſtacle, beſides the *Rugæ* of the *Urethra*, and the Reſiſtance of the *Verumontanum*, is ſometimes a ſmall Projection of the Orifice of the Bladder, in the *Urethra*, like that of the *Os Tincæ* in the *Vagina*, which occaſions the End of the Sound to ſlip a little beyond it.

It is not to be ſuppoſed, that by ſearching, one can poſſibly judge of the Size and Form of a Stone; and indeed the Frequency of

of the Fits, and Violence of the Symptoms, are a better Rule to go by; though whoever ſhall think himſelf capable of diſtinguiſhing abſolutely the Difference of Stones, even by theſe Circumſtances, will ſometimes be miſtaken; ſince the Frequency and Violence of the Pain depend not always merely upon their Magnitude or Shape; and there are ſome Inſtances, where a Stone of ſix grains weight, has for ſeveral Months given more Pain in one Perſon, than a much larger has in another, however, *cæteris paribus*, a large or a rough Stone is worſe than a ſmall or a ſmooth one.

Though upon ſearching, we are aſſured of a Stone in the Bladder, we are not, without further Inquiry, to operate immediately; ſince there are ſometimes Obſtacles which forbid the Operation, either abſolutely, or only for a certain time; among theſe, that of greateſt Conſequence, is the Gravel or Stone in the Kidneys, which is known by the Pain in the Loins, Vomitings, Contractions of the Teſticles, Numbneſs of the Thighs, and often by Matter which the Inflammation produces in the Kidneys. The Objections of leſs Weight, and which frequently are removed; are a Fit of the Stone, a Cough, a Hectic, and

being emaciated by long Pain; exceſſive hot or cold Weather, are likewiſe Hindrances: But in extremity of Danger, theſe laſt Conſiderations may be diſregarded, tho' no doubt very hot Weather is more inconvenient and dangerous than cold, as lying-a-bed is then more troubleſome, and the Urine much ſalter.

Difference of Age makes an extreme Difference in Danger, Infants and young People almoſt always recovering; but ſtill the Operation is adviſable on thoſe advanced in Years, tho' it is not attended with near the ſame Succeſs. This Operation is performed four ſeveral Ways, all which I ſhall deſcribe with their particular Inconveniencies, that we may the more eaſily pitch upon that which has the leaſt.

Before we perform any of them, 'twill be proper to prepare the Patient with a gentle Purge, the preceding Day, and a Clyſter early in the Morning, which will be of great ſervice in cooling the Body, and making ſome of the Operations leſs dangerous where the *Rectum* is liable to be wounded, when full.

CHAP.

CHAP. XVIII.

Of the LESSER APPARATUS, *or Cutting on the* GRIPE.

THE moſt ancient way of cutting for the Stone, is that deſcribed by *Celſus*, and known by the Name of *cutting on the Gripe*, though ſince the Time of *Johannes de Romanis*, it is alſo called, *Cutting with the leſſer Apparatus*, to diſtinguiſh it from his new Method, which on account of the many Inſtruments employed in it, is called *Cutting with the Greater Apparatus*. The Manner of doing the Operation is this: You firſt introduce the Fore-finger and Middle-finger of the left Hand, dipt in Oil, up the *Anus*, and preſſing ſoftly with your right Hand above the *Os Pubis*, endeavour to bring the Stone towards the Neck of the Bladder; then making an Inciſion, on the left Side of the *Perinæum*, above the *Anus*, directly upon the Stone, you turn it out through the Wound, either with your Fingers or a Scoop.

This Way of Cutting was attended with many Difficulties, for want of proper Inſtruments to direct the Inciſion, and extract the Stone, when it lay beyond the Reach

of the Fingers, which in a large Bladder was frequently the Caſe; ſo that 'tis ſtrange *Celſus* confined the Operation to the Age between Nine and Fourteen, ſince it is much eaſier to be performed in Infancy, than at thoſe Years; and it plainly appears from his Account of it, that many died from the Violence done to the Bladder in endeavouring to bring the Stone forwards, though the Operators failed in their Attempt, and the Patients were not cut.

The Wound of the Bladder in this Operation is made in the ſame Place as is now practiſed in the Lateral Method; but it being impracticable on ſome Subjects, and uncertain on all others, has made it univerſally exploded; ſo that no body now makes an Inciſion without the Direction of a Staff, unleſs a Stone entirely prevents the Introduction of it, by preſſing againſt, and ſtopping up the Neck of the Bladder; and in this Caſe, when we cut directly upon the Stone, it is much ſafer to puſh it back further into the Bladder, and lay hold of it with the Forceps, than to endeavour with the Scoop or Fingers to force it outwards, which Circumſtance alone makes it different from *Celſus*'s Method. It muſt be diſtinguiſhed however, when I ſpeak of puſhing the

the Stone back, that I ſuppoſe it in the Neck of the Bladder; for it frequently happens that it lies at the Extremity of the *Urethra*, on the Outſide of the Bladder; in which Caſe the Wound of the *Urethra* may be made large enough to turn it out with the Fingers, or the End of ſome ſlender Inſtrument.

CHAP. XIX.

Of the GREATER APPARATUS, *or the* Old Way.

THIS Method of Cutting, invented by *Johannes de Romanis*, and publiſhed by his Scholar *Marianus* in the Year 1524, has at different Times, and with different People, varied conſiderably in ſome of its Proceſſes, and particularly with regard to the Uſe of certain Inſtruments. What I ſhall deſcribe, will be the Manner, in which it is now practiſed with all its Improvements.

Having laid the Patient on a ſquare horizontal Table, three Feet four Inches high, with a Pillow under his Head, let his Legs and Thighs be bent, and his Heels made to approach his Buttocks, by tying his Hands to the Bottom of his Feet, with a Couple

of ſtrong Ligatures, about two Yards long; and to ſecure him more effectually from ſtruggling, paſs a double Ligature under one of his Hams, and carry the four Strings round his Neck to the other Ham; then paſſing the Loop underneath it, make a Knot by threading one of the ſingle Ends thro' the Loop: After this, the Thighs being widened from each other, and firmly ſupported by proper Perſons, you introduce the Staff, having firſt dipt it in Oil, which muſt be held by your Aſſiſtant, a little leaning on the left Side of the Seam in *Perinæo*; and beginning the external Wound juſt below the *Scrotum*, (which muſt be held out of the Way) you continue it downwards, to within two Fingers Breadth of the *Anus*; then leaving that Direction, you ſlip the Knife forwards in the Groove, pretty far into the bulbous Part of the *Urethra*; or, as there is ſome Danger of wounding the *Rectum*, in the Continuation of the Inciſion you may turn the Knife with the Back towards it, and make this Part of the Inciſion, from within outwards. Should a very large Veſſel be cut, it will be adviſeable to tie it before you proceed any farther in the Operation. When the Wound is made, ſlide the Gorget along the Groove of the Staff into

into the Bladder; and to do it with more Safety, when the Beak of it is received in the Groove, 'twill be proper to take the Staff yourſelf in your left Hand; for if the Aſſiſtant ſhould, unwarily, either incline the Handle of it too much towards you, or not reſiſt enough to the Force of the Gorget it is very apt to ſlip out of the Groove, between the *Rectum* and the Bladder, which Accident is not only inconvenient to the Operator for the preſent, but is attended for the moſt part with very bad Conſequences. The Gorget being paſſed, dilate the *Urethra* and Neck of the Bladder with your Fore-finger, and introduce the Forceps into the Bladder, keeping them ſhut 'till you touch the Stone, when you muſt graſp it with a moderate Force, and extract it by pulling downwards towards the *Rectum*. Should you find a Difficulty in laying hold of the Stone, be careful to keep your Forceps in ſuch a Poſition, that they may open upwards and downwards, (not laterally) which will very much facilitate the embracing of the Stone, in caſe it ſhould happen to be thin and flat.

CHAP. XX.

Of the HIGH OPERATION.

THIS Method of Cutting for the Stone was firſt publiſhed in the Year 1561, by *Pierre Franco*, who in his Treatiſe of *Hernias* ſays he once performed it on a Child with very good Succeſs, but diſcourages the farther Practice of it. After him, *Roſſetus* recommended it with great Zeal, in his Book intitled *Partus Cæſareus*, printed in 1591; but he never performed the Operation himſelf. Monſieur *Tolet* makes mention of its having been tried in the *Hotel Dieu*; but without entering into the particular Cauſes of its Diſcontinuance, ſays only that it was found inconvenient. About the Year 1719, it was firſt done in *England* by Mr. *Douglas*, and after him practiſed by others. The Manner of performing it, with the Improvements made ſince *Franco*'s Operation, is this:

The Patient being laid on a ſquare Table, with his Legs hanging off, and faſtened to the Sides of it by a Ligature paſſed above the Knee, his Head and Body lifted up a little by Pillows, ſo as to relax the abdominal Muſcles, and his Hands held ſteady by ſome

ſome Aſſiſtants; inject through a Catheter into the Bladder as much Barley-water as he can bear, which in a Man, is often about eight Ounces, and ſometimes, twelve: For the more eaſily doing this, an Ox's *Ureter* may be tied to the Extremity of the Syringe, and Handle of the Catheter, which being pliable, will prevent any painful Motion of the Inſtrument in the Bladder.

The Bladder being filled, an Aſſiſtant, in order to prevent the Reflux of the Water, muſt graſp the *Penis* the Moment the Catheter is withdrawn, holding it on one Side, in ſuch a manner, as not to ſtretch the Skin of the *Abdomen*; then with a round-edged Knife make an Inciſion about four Inches long, between the *Recti* and Pyramidal Muſcles, through the *Membrana Adipoſa*, as deep as the Bladder, bringing its Extremity almoſt down to the *Penis*; after this, taking a crooked Knife, continue the Inciſion into the Bladder, carrying it a little under the *Os Pubis*, and immediately upon the Water's flowing out, introduce the Fore-finger of you left Hand, which will direct the Forceps to the Stone.

This Method was at firſt received with great Applauſe in *London*, but after ſome Trial

Trial was rejected, for the following Inconveniencies:

It ſometimes happens that the Bladder, notwithſtanding the Injection, ſtill continues ſo deep under the *Os Pubis*, that the *Peritonæum* being neceſſarily wounded firſt, the Inteſtines puſh out immediately at the Orifice, and the Urine afterwards empties into the *Abdomen*; in which Caſe, hardly any recover. The Injection itſelf is exceedingly painful, and however ſlowly the Fluid be injected, it diſtends the Bladder ſo much more ſuddenly than the Urine from the Kidneys does, and ſo much faſter than it can well bear, that it not only is ſeldom dilated enough to make the Operation abſolutely ſecure, but is ſometimes even burſt, or at leaſt its Tone deſtroyed by the haſty Dilatation. What adds to the Danger here, is the Poſſibility of meeting with a contracted indurated Bladder, which is a Circumſtance ſometimes attending on the Stone, and indeed an exceedingly dangerous one in all the other Methods, but would be frightful in this, by reaſon not only of the neceſſity of wounding the *Peritonæum*, but of the Difficulty of coming at the Stone. If the Stone be very ſmall, it is hard to lay hold of it with the Forceps, and in a fat Man,

Man, the Fingers are not long enough for that Purpoſe. If there are many little Stones, it will ſcarce happen that more than one at a time can be extracted; and if the Stone breaks, it not only is impracticable to take it all away in the Operation, but alſo from the ſupine Poſture of the Patient, it will generally remain in the Bladder; whereas in the other Methods, for the moſt part, it works itſelf out with the Urine. But even ſuppoſing that the Operation itſelf is proſperous, the Conſequences generally are very troubleſome; for the Urine iſſuing out at an Orifice where there is no Deſcent, ſpreads itſelf upon the *Abdomen*, and makes very painful Excoriations; though, what is ſtill worſe, it ſometimes inſinuates itſelf into the Cells between the Bladder and *Abdominal* Muſcles, and together with the Inflammation excited by the Operation, brings on a Suppuration there, which is always difficult to manage, and frequently mortal.

CHAP. XIII.

Of the LATERAL OPERATION.

THIS Method was invented by an Eccleſiaſtic, who called himſelf *Frere Jaques:* He came to *Paris* in the Year 1697,

1697, bringing with him an abundance of Certificates of his Dexterity in operating; and making his Hiſtory known to the Court, and Magiſtrates of the City, he got an Order to cut at the *Hotel Dieu*, and the *Charité*, where he performed this Operation on about fifty Perſons. His Succeſs did not anſwer the Promiſes he had made; and from that Time his Reputation ſeems to have declined in the World, if we may give Credit to *Dionis*, who has furniſhed us with theſe Particulars.

He was treated by the Surgeons of thoſe Times as ignorant and barbarous: and tho' upon enquiry into the Parts which ſuffer in this Method, it was once the Opinion of ſome of the moſt eminent amongſt them, that it might be made a moſt uſeful Operation, if a few Imperfections in the Execution of it were removed; yet after having given this Judgment, they ſuddenly dropt the Purſuit, for no other reaſon, to all Appearance, but that they would not be obliged to any one but a regular Surgeon for a Diſcovery of ſo great Conſequence. The principal Defect in his Manner of cutting, was the want of a Groove in his Staff, which made it difficult to carry the Knife exactly into the Bladder; nor did he take

any

any Care of his Patients after the Operation; ſo that for want of proper Dreſſings, ſome of the Wounds proved fiſtulous, and other ill Conſequences enſued: But I am inclined to think he ſucceeded better, and knew more at laſt, than is generally imagined; for I remember to have ſeen, when I was in *France*, a ſmall Pamphlet, publiſhed by him in the Year 1702, in which his Method of Operation appeared ſo much improved, that it differed in nothing, or but very little, from the preſent Practice. He had by this time, learnt the Neceſſity of dreſſing the Wound after the Operation, and had profited ſo much from the Criticiſms of Meſſieurs *Mery*, *Fagon*, *Felix*, and *Hunauld*, that he then uſed a Staff with a Groove; and what is more extraordinary, had cut thirty-eight Patients ſucceſſively at *Verſailles*, without loſing one, as appeared by a Certificate annexed to the Piece.

Amongſt many that ſaw *Frere Jaques* operate, was the famous Profeſſor *Rau*, who carried his Method into *Holland*, and practiſed it with amazing Succeſs: He never publiſhed any Account of it himſelf, though he admitted ſeveral to his Operations; but ſince his Death, his Succeſſor *Albinus*, Profeſſor of Anatomy and Surgery at

at *Leyden*, has given the World a very circumſtantial Detail of the ſeveral Proceſſes of it, and mentions as an Improvement upon *Frere Jaques*'s Manner, that he made his Inciſion thro' the Bladder beyond the Proſtate; but whoever will try the Experiment of making a Wound in that Place, without touching the Proſtate, on a Staff, ſuch as *Albinus* has delineated, which is of an ordinary Length, will find it almoſt impracticable; for if by inclining the Staff a little towards the *Abdomen* and right Groin, you endeavour to raiſe that part of the Bladder towards the Wound, it ſlips out all but the very End of it into the *Urethra*, and leaves no Direction for the Knife. Beſides, that he cut the Proſtate, may be gathered from the Event of ſome Caſes which Mr. *Cheſelden* publiſhed, when he firſt undertook the Lateral Operation: He conſidered it as almoſt impoſſible to make the Inciſion in this Place, unleſs the Bladder were diſtended, to which purpoſe, he injected as much Barley-water as the Patient could ſuffer, which made it protuberate forwards, and lie in the Way of the external Wound; ſo that leaving the Staff in, he cut very eaſily upon it. The Operations were exceedingly dextrous; but the Wound of the Blad-

Bladder retiring back, when it was empty, did not leave a ready Iſſue for the Urine, which inſinuating itſelf amongſt the neighbouring Muſcles and Cellular Membranes, deſtroyed Four of the Ten which he practiſed this Method upon, and ſome of the others narrowly eſcaped.

If therefore, this was the Conſequence of a Wound of the Bladder beyond the Proſtate, in ſo many Inſtances, and we find by experience that it is exceedingly difficult in ſome Men to carry the Inciſion even ſo far as the Proſtate, ſure it is poſſible that *Albinus* may be miſtaken in his Deſcription, or even that *Rau* himſelf, if he was of that Opinion, might be deceived in the Parts he wounded; ſince we know it was generally thought, till within theſe few Years, that the Bladder itſelf was cut in the old Way.

After this unſucceſsful Trial, Mr. *Cheſelden* made uſe of the following Method, which is now the Practice of moſt *Engliſh* Operators.

The Patient being laid on a Table, with his Hands and Feet tied, and the Staff paſſed as in the old Way, let your Aſſiſtant hold it a little ſlanting on one Side, ſo that the Direction of it may run exactly thro' the Middle

Middle of the left *Erector Penis* and *Accelerator Urinæ* Muſcles; then make your Inciſion through the Skin and Fat, very large, beginning on one Side of the Seam in *Perinæo*, a little above the Place wounded in the old Way, and finiſhing a little below the *Anus*, between it and the Tuberoſity of the *Iſchium*: This Wound muſt be carried on deeper between the Muſcles, 'till the Proſtate can be felt, when ſearching for the Staff, and fixing it properly, if it has ſlipt, you muſt turn the Edge of the Knife upwards, and cut the whole Length of that Gland from within outwards, at the ſame time puſhing down the *Rectum* with a Finger or two of the left Hand; by which Precautions, the Gut will always eſcape wounding; after which, the Operation finiſhes nearly in the ſame manner, as with the greater Apparatus.

If upon introducing the Forceps, you do not perceive the Stone readily, you muſt lift up their Handle, and feel almoſt perpendicularly for it, ſince for the moſt part when it is hard to come at, it lies in one of the *Sinuſes* ſometimes formed on each Side of the Neck of the Bladder, which project forward in ſuch a manner, that if the Stone lie there, the Forceps paſs beyond it the moment

moment they are through the Wound; ſo that it would be impoſſible to lay hold of it, or even to feel it, if not aware of this Circumſtance.

When the Stone breaks, it is much ſafer to take away the Fragments with the Forceps, than to leave them to be diſcharged with the Urine; and if the Pieces are very ſmall, like Sand, a Scoop is the beſt Inſtrument; though ſome prefer the injecting Barley-water into the Bladder, which ſuddenly returning, brings away the broken Particles of the Stone.

As there are hardly any Inſtances of more Stones than one, when the Stone taken away is rough; ſo when it is ſmooth and poliſhed in any part of it, 'tis almoſt a certain ſign of others behind; on which account, an Operator ſhould be careful, in that Caſe, to examine not only with his Fingers, but ſome convenient Inſtrument, for the remaining ones; tho' indeed, in all Caſes, it may be proper to examine the Bladder after the Extraction of a Stone; becauſe it is poſſible there may be a ſecond Stone, notwithſtanding the firſt be rough.

The great Inconvenience of the lateral Operation is the Hæmorrhage which ſometimes enſues in Men: for in Children the

Danger of it is not worth mentioning; this however is the principal Objection which has prevented it being univerſally practiſed; but in all likelihood it will be more general, when the Merits of the Method are better known, and it is once diſcovered that the ill Conſequence of moſt of theſe Hæmorrhages is owing more to an Error in operating, than to the nature of the Operation; for I think I can poſitively ſay, that all thoſe Branches of the Hypogaſtrick Artery which lie on this Side of the Proſtate, may be taken up with the Needle, if the Wound be made large enough, to turn it about freely at the Bottom; yet this is a circumſtance, that many Surgeons have been deficient in, and inſtead of making it three or four Inches long in a Man, they have ſometimes made it not above an Inch; in which caſe, it is not only impoſſible to tie the Veſſels between the Skin and Bladder, but it alſo prevents the proper Application of Lint, or Stypticks to the Artery creeping on the Proſtate: ſo that it is not ſurpriſing the Operation ſhould be diſcountenanced, when the Practice of it is attended with this Difficulty.

I have here mentioned Lint or Stypticks, as a proper Application to ſtop the Hæmorrhage

morrhage from the Artery of the Proſtate; but if they ſhould not prove effectual, I would adviſe the Introduction of a ſilver Canula through the Wound into the Bladder, which ſhould be three or four Inches long, according to the Depth of the Wound; and almoſt as thick as a Man's little Finger. It muſt be covered with Rag or Lint (that it may lie ſoft) and continue in the Bladder two or three Days, before it is taken away.

If in the Operation any very large Veſſel of the external Wound ſhould be divided, it is adviſeable to tie it before the Extraction of the Stone; but the Neceſſity of doing this, does not occur once in twenty times: It rarely happens that the Veſſels of the Proſtate burſt open any conſiderable time after the Operation, if they did not bleed during the Performance of it; but as it is the nature of the Symptomatick Fever, to dilate the Veſſels, and quicken the Motion of the Blood, 'tis proper to be upon our Guard, eſpecially in plethorick People, and endeavour to obviate the Accident, by taking away ten or twelve Ounces of Blood from the Arm, and giving an Opiate immediately.

There is but one Object more of any conſequence, which is the danger of wounding the *Rectum*; and this I confeſs is a very troubleſome Accident: But if the Operator obſerves the Rule I have laid down with regard to that Article, I ſhould hope a it might always be avoided.

In this Deſcription, I believe I have been ſo far from diſguiſing the Inconveniencies of the Lateral Operation, that before I ſpeak of its Advantages I ſhould once again repeat, that theſe Effuſions of Blood are but very rare, and ſeldom or never mortal, when properly managed; of which the World needs no better Proof than the late extraordinary Succeſs we have cut with in our Hoſpitals, which I believe has never been equalled in any Time, or Country.

In this Method the remarkable Parts, wounded by the Knife are, the *Muſculus Tranſverſalis Penis*, *Levator Ani*, and *Proſtate Gland:* In the old Way, the *Urethra* only is wounded, about two Inches on this ſide the Proſtate, and the Inſtruments are forced thro' the reſt of the Paſſage, which is compoſed of the bulbous Part of the *Urethra*, the membranous Part of the *Urethra*, the Neck of the Bladder, and *Proſtate Gland.* This Channel is ſo very narrow, that

that till it be torn to pieces, the Management of the Forceps is exceedingly difficult, and it happens frequently, that from the tender Texture of the membranous Parts, the Forceps are unwarily puſhed thro' it between the *Os Pubis* and Bladder; beſides that in introducing the Gorget upon the Staff, it is apt to ſlip downwards, between the *Rectum* and Bladder, both which Inconveniencies are avoided in the Lateral Operation. It is true, the Wound made in the Lateral Method, will not admit of the Extraction of a large Stone without Laceration, as well as in the old Way; but in the one Caſe, the Laceration is ſmall, and made after a Preparation for it by an Inciſion, and in the other, all the Parts I have mentioned are torn without any previous Opening, and which are ſo very tight, that the Pain of the Diſtenſion muſt neceſſarily be exceſſive. It is pity, the Operators do not in the old Way always ſlide the Knife along the Groove of the Staff, 'till they have quite wounded through the length of the Proſtate, ſince they are convinced, that by the Extraction of the Stone, it is opened in a ruder and more dangerous Manner than by Inciſion, and without any Advantages from it; becauſe this Opening

is made by the finiſhing of the Operation; whereas for want of it before the Extraction, we can hardly widen the Forceps enough to receive a large Stone; and when we do, the Reſiſtance is ſo very great, as often to break it, notwithſtanding all our Care. However, in both theſe Operations, the Surgeon muſt not graſp the Stone with Violence, and even in extracting, muſt with both Hands to the Branches of his Forceps, reſiſt their ſhutting ſo tight, as the Compreſſion from the Lips of ſuch a narrow Wound would otherwiſe make them: Here I ſpeak of the Difficulty of laying hold of a Stone in any Part of the Bladder; but if it happen to lie in one of the *Sinuſes* before-mentioned, the Forceps are ſo confined that it becomes ſtill harder. The Extraction of very large Stones, is much more impracticable with the greater Apparatus than by this Method, becauſe of the ſmallneſs of the Angle of the Bones in that Part where the Wound is made; ſo that indeed is is neceſſary in almoſt all Extractions to pull the Stone downward towards the *Rectum*, which cannot be done without great Violence to the membranous Parts, and even the Separation of one from another; whence follow Abſceſſes and Sloughs

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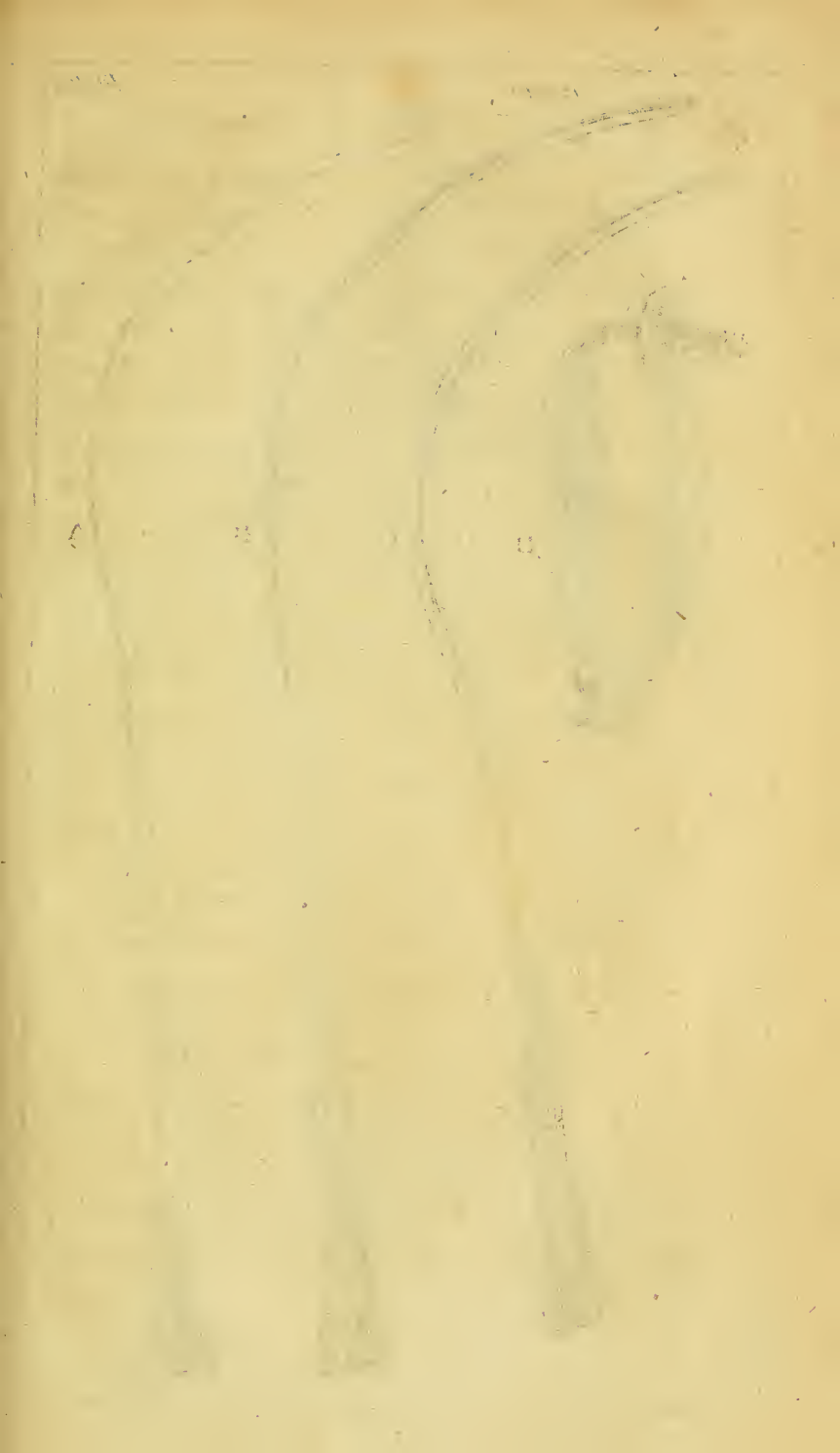

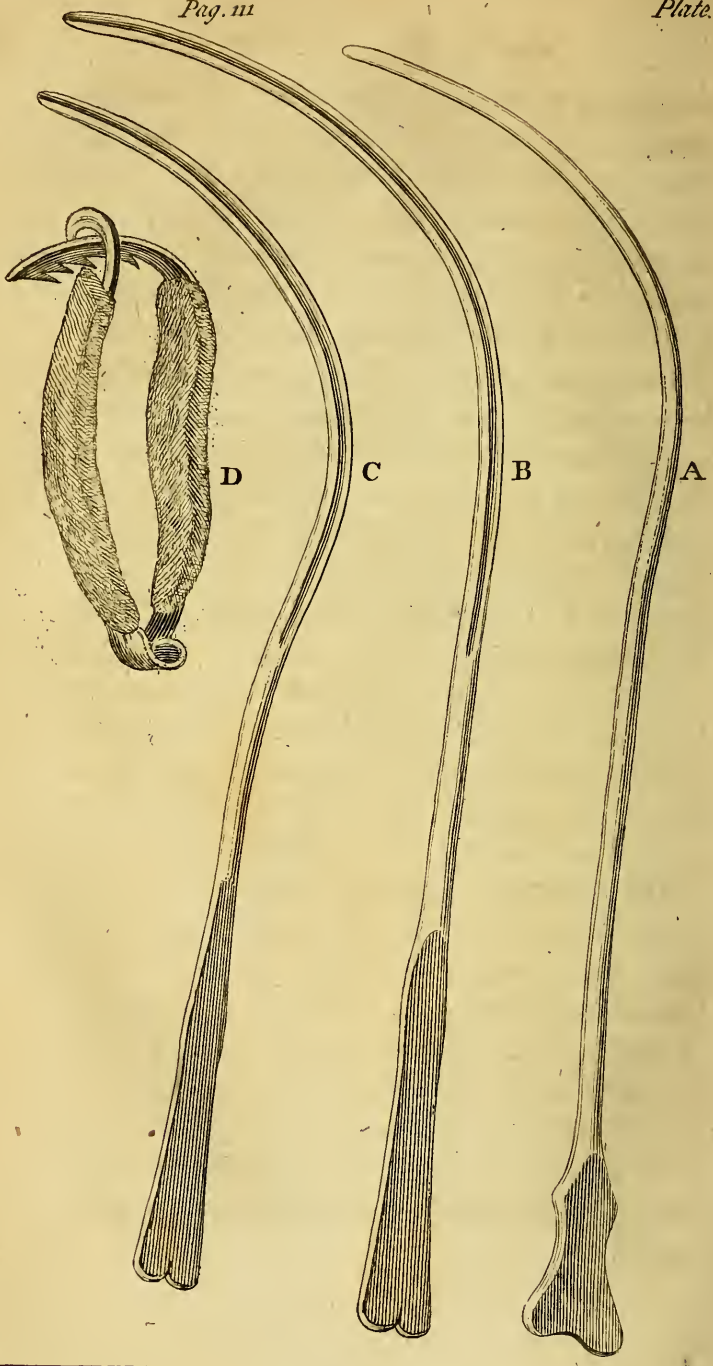
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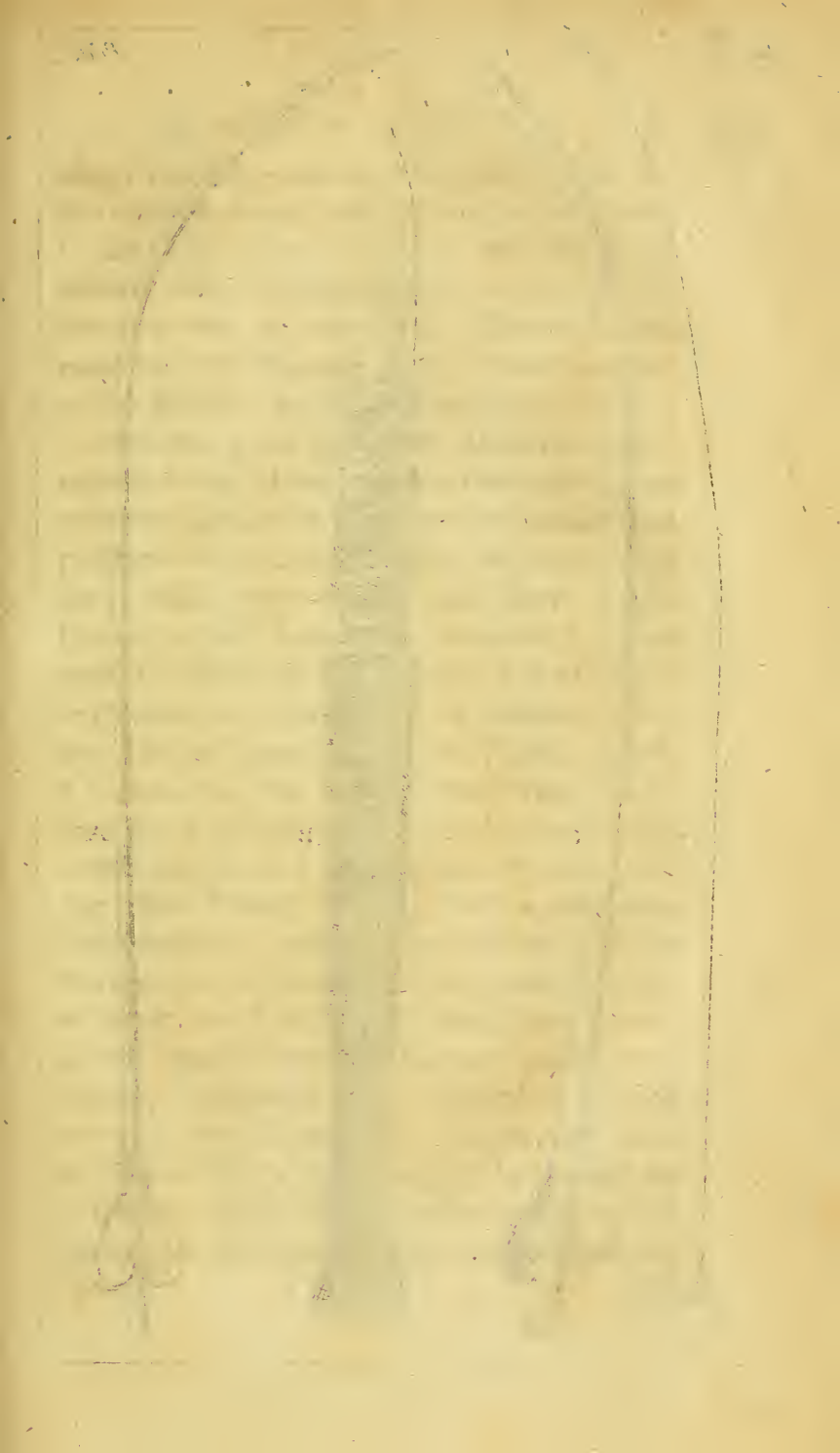
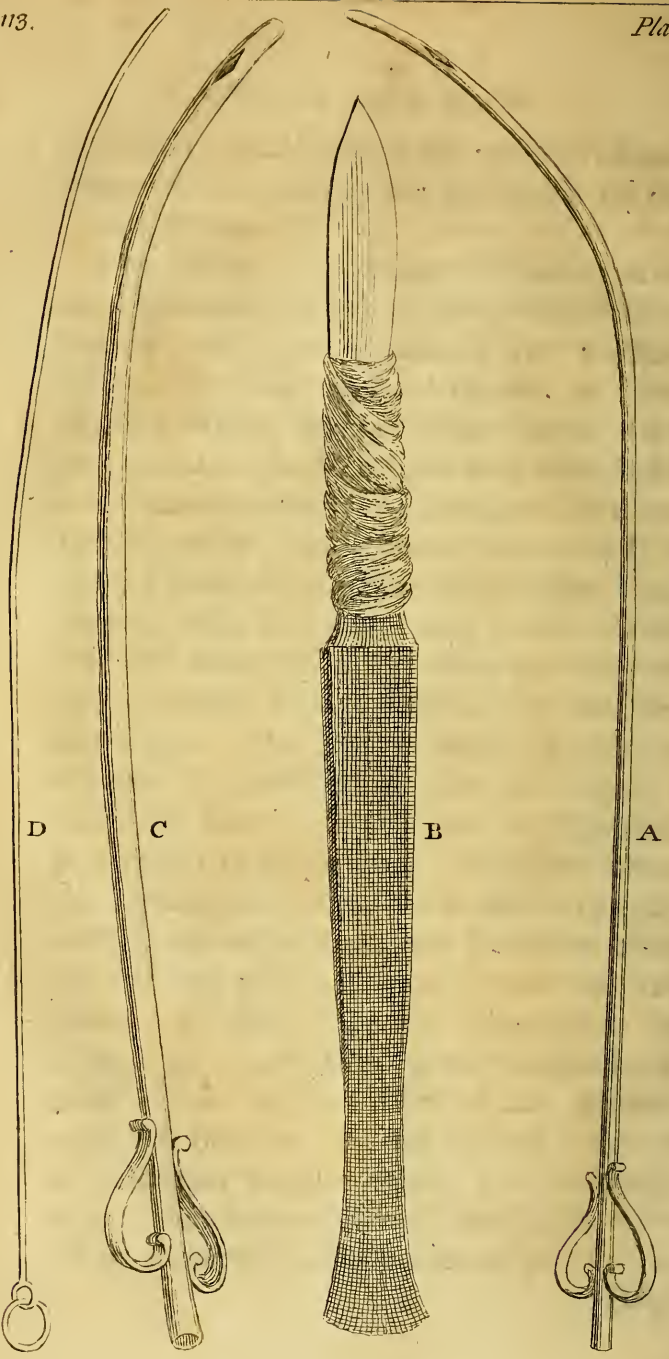
about the Wound, which is a Circumſtance not known in the Lateral Operation. *Ecchymoſes* followed by Suppuration and Gangrene, ſometimes ſpread themſelves upon the *Scrotum*, and in ſhort, all the Inconveniences and ill Symptoms which attend upon the Lateral Operation, except the Hæmorrhage, are in a more violent Degree, incident to the old Way.

An Incontinence of Urine, is not common after the Lateral Operation, and a Fiſtula ſeldom or never the Conſequence of it; but the Prevention of a Fiſtula ſeems to depend very much upon the Skill of dreſſing the Wound afterwards; and perhaps it would not ſo often happen, if the Dreſſing were rightly managed in the old Way, though certainly this Method is much more liable to them, as the Wound is made among Membranes, is more contuſed, and in many, from an Incontinence of Urine, is continually kept open. I have ſeen ſome Inſtances indeed in the Lateral Operation, where through Neglect, the Bladder has remained fiſtulous, but the Wound being in a fleſhy Part, I have, without great Difficulty, got little Granulations to ſhoot up, and healed it externally; ſo that at preſent I think a Fiſtula

can hardly be acounted one of the Inconveniencies of cutting for the Stone in the Lateral Way.

The Manner of treating the Patient after the Operation, is pretty nearly this: If it happens, that the Veſſels of the Proſtate bleed, dry Lint, or Lint dipped in ſome ſtyptick Water, ſuch as *Aqua Vitrioli*, muſt be applied to the Part, and held there with a conſiderable degree of Preſſure for a few Hours, or as I have before mentioned, a ſilver Canula of three or four Inches long, covered with fine Rag, may be introduced into the Bladder and left there two or three Days, which ſeldom fails to ſtop the Hæmorrhage. The Patient may alſo take an Opiate. If the Wound does not bleed, a little dry Lint, or a Pledgit of Digeſtive, laid gently in it, is beſt. The Place where the Patient lies ſhould be moderately cool, as Heat not only diſpoſes the Veſſels to bleed afreſh, but generally makes him low and faint. If ſoon after the Operation, he complains of a Sickneſs at the Stomach, or even a Pain in that Part of the *Abdomen* near the Bladder, 'tis not always a ſign of a dangerous Inflammation, but frequently goes off in half an Hour: To aſſiſt however in its removal, a Fomentation put into an Hog's

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Hog's Bladder, and applied pretty warm to the Part in pain, will be of great ſervice: If the Pain increaſes, after two or three Hours, the Conſequence is much to be feared; and in this Caſe, Bleeding and emollient Clyſters by way of Fomentation to the Bowels, are immediately neceſſary.

The firſt good Symptom after the Operation, is the Urine coming freely away, as we then know the Lips of the Bladder and proſtate Gland are not much inflamed; for they often grow turgid, and ſhut up the Orifice in ſuch a manner, as not only to prevent the Iſſue of the Water, but even the Introduction of the Finger or female Catheter, ſo that ſometimes we are forced to paſs a Catheter by the *Penis*. From this Symptom too we learn, that the Kidneys are not ſo affected by the Operation as to ceaſe doing their Office, which, tho' a very rare Circumſtance, may poſſibly occur. If the Patient ſhould become languid, and continue without any Appetite, Bliſters prove beneficial, which may be applied with great Safety, and little Pain; as there is ſeldom or never any Strangury. About the third or fourth Day a Stool muſt be procured by a Clyſter, for it ſeldom comes naturally the firſt time, and this Method muſt be continued

nued as every Man's Diſcretion ſhall guide him. As ſoon as the Patient comes to an Appetite, he ſhould be indulged in eating light Food, with this Caution, that he do not eat too much at a time: It ſometimes happens that a Fortnight or three Weeks after the Operation, one or both Teſticles indurate and inflame; which Diſorder may generally be removed by Fomentations and diſcutient Applications; or if a Suppuration enſue, which however is very ſeldom the Caſe, the Abſceſs is not very difficult of Cure.

If during the Cure the Buttocks ſhould be excoriated by the Urine, let them be anointed with *Nutritum:* The Dreſſing from firſt to laſt, is ſeldom any other than a ſoft Digeſtive, or dry Lint; for the whole Art of healing the Wound, conſiſts in the Force with which the Doſſil is applied; if it be crammed in hard, it becomes a Tent, and prevents the Growth of the little tender Shoots of Fleſh, till in proceſs of time, from the continual Diſtenſion, and long Drain of the Urine, the whole Cavity becomes callous and forms itſelf into a Fiſtula: On the other hand, if the Wound be dreſſed quite ſuperficially, the external Parts of it being more prone to heal and contract than

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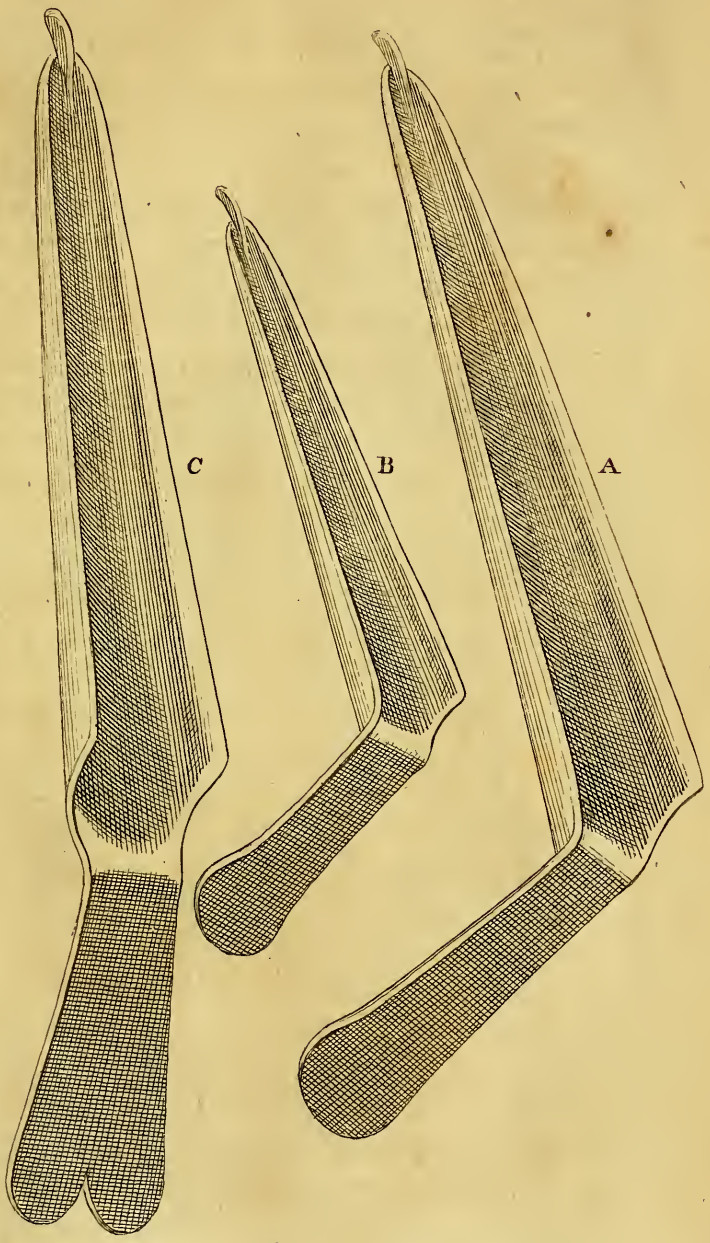
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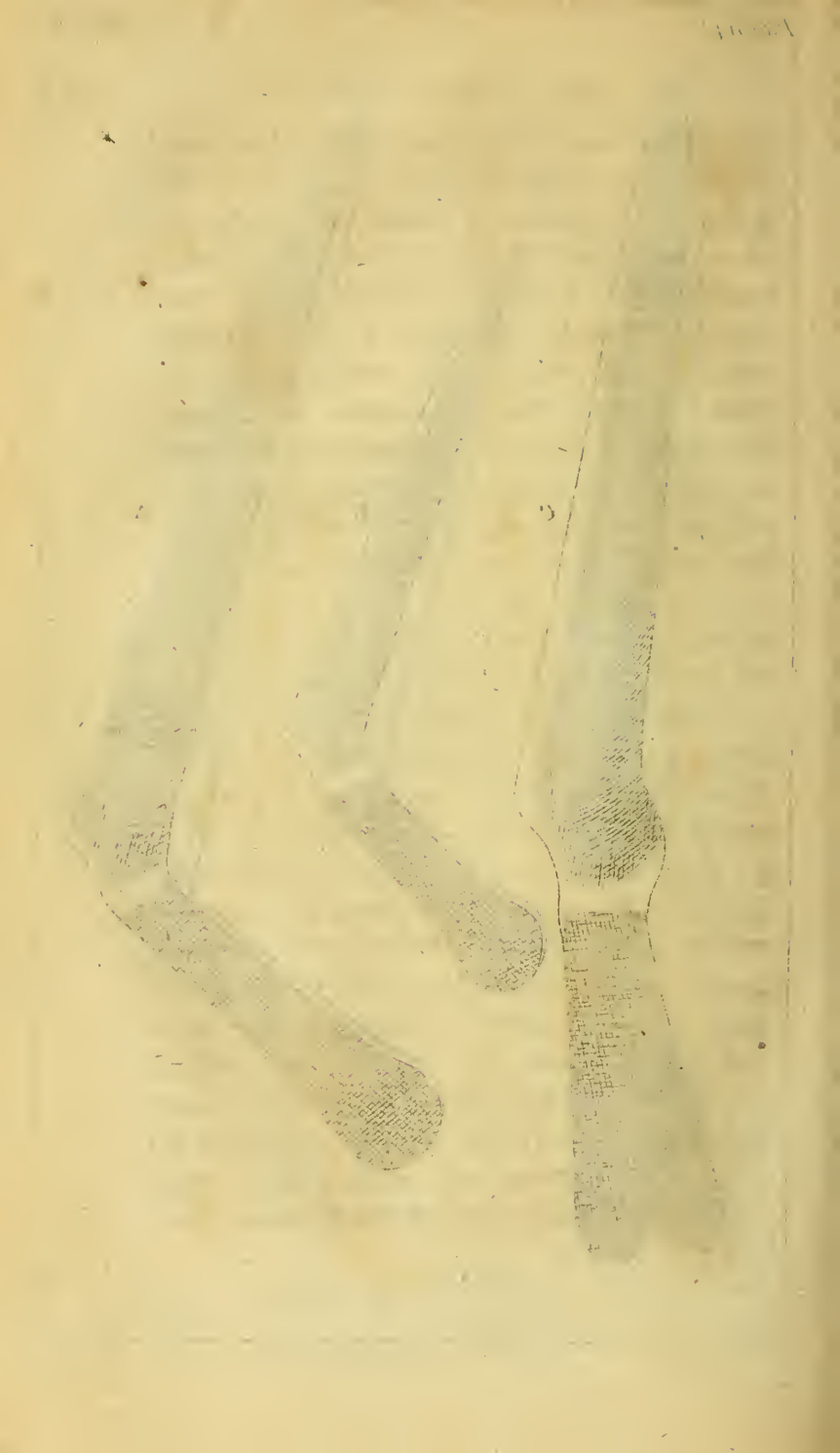

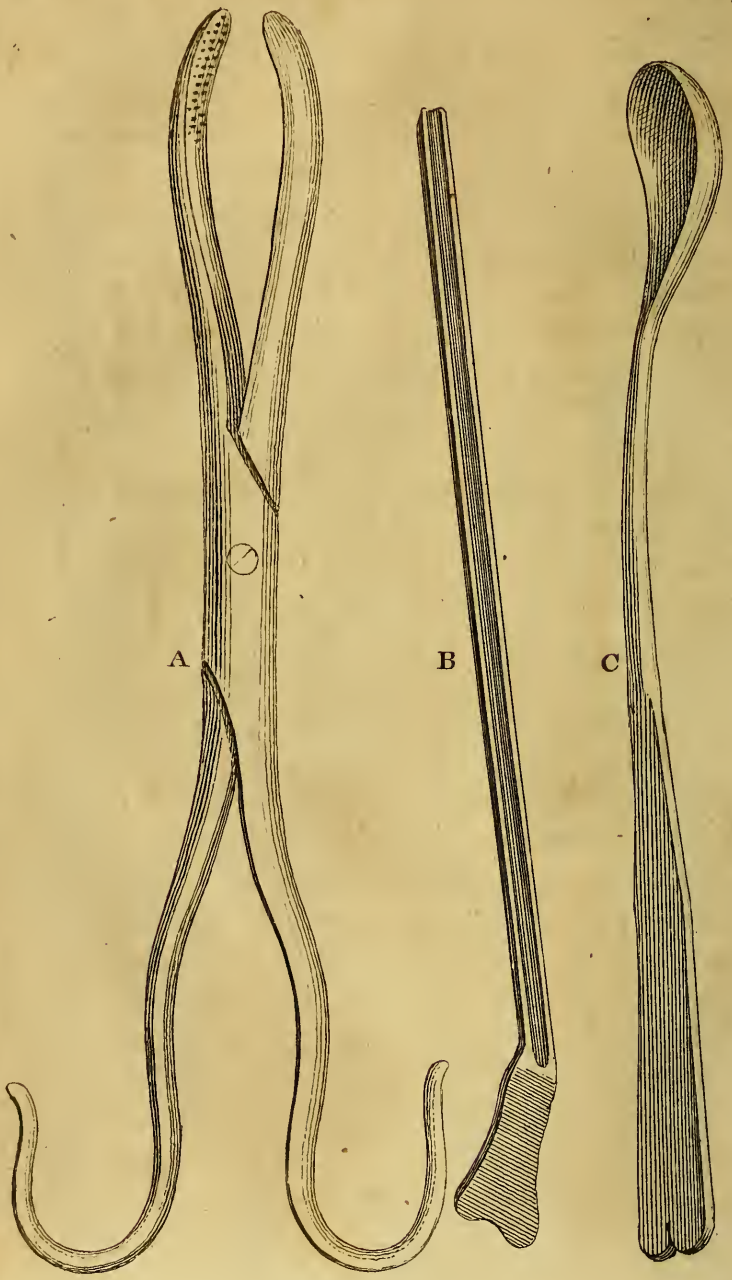
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the internal, the Conſequence will be a degree of Obſtruction to the Urine and Matter, which lying about the Wound of the Bladder, for want of a Diſcharge, will indurate that Part, and likewiſe occaſion a Fiſtula. This Method of Dreſſing is not peculiar to Wounds after cutting for the Stone, but is as applicabe to *Fiſtulas in Ano*, and almoſt all Abſceſſes whatſoever; ſo that the Branch of Surgery, whieh regards the Treatment of hollow Wounds, depends much more on the proper Obſervance of this Rule, than the Application of particular Medicines.

CHAP. XXII.

Of the STONE *in the* URETHRA.

IF a ſmall Stone be lodged in the *Urethra* near the Glans, it may often be puſhed out with the Fingers, or picked away with ſome Inſtrument; but if it ſtops in any other part of the Channel, it may be cut upon without an Inconvenience: the beſt way of doing it, is to pull the Prepuce over the Glans, as far as you can, and then making an Inciſion the Length of the Stone, through the Teguments, it may be turned out with a little Hook or the Point of a Probe:

Probe: The Wound of the Skin ſlipping back afterwards, to its proper Situation, and from the Orifice of the *Urethra*, prevents the iſſue of the Urine thro' that Orifice, and very often heals in Twenty-four Hours. This is a much leſs painful Method of extracting Stones from the *Urethra*, than by any Inſtruments that have hitherto been deviſed.

CHAP. XXIII.

Of the Extraction of the STONE *in* WOMEN.

THE Extraction of the Stone in Women, will eaſily be underſtood, ſince the whole Operation conſiſts in placing them in the ſame Manner as Men, and without making any Wound, introducing into the Bladder a ſtraight Director, upon that a Gorget, and afterwards, the Forceps to take hold of the Stone; all which, may be done without Difficulty, by reaſon of the Shortneſs of the *Urethra*. If the Stone proves very large, and in extracting draws the Bladder forwards, 'tis adviſeable to make an Inciſion through the Neck of it, upon the Stone, which not only will facilitate the Extraction, but alſo be leſs dangerous than a Laceration, which would neceſſarily follow. The Dreſſings are Fomentations

mentations and emollient Ointments, which ſhould be applied two or three times a-day, and the Patient in other Reſpects be treated like Men who have undergone the Operation for the Stone.

PLATE IV.

The EXPLANATION.

A. A Sound uſed in ſearching for the Stone.

The Size repreſented here is but a little too large for the youngeſt Children, and may be uſed upon Boys till they are thirteen or fourteen Years of Age; a larger ſhould be employed between that Age and Adultneſs, when one of about ten Inches, in a right Line from the Handle to the Extremity, is proper. This ſhould be made of Steel, and its Extremity be round and ſmooth.

B. A Staff fit for the Operation on Boys from eight to fourteen Years of Age. The Staff for a Man muſt be of the Size of the Sound I have already deſcribed.

C. A Staff ſomething too big for the ſmalleſt Children, but may be uſed upon Boys from about four Years of Age to eight.

The

The Staff has a Groove on its convex Side, which firſt ſerves as a Direction where to cut, and afterwards receiving the Beak of the Gorget, guides it readily into the Bladder. Care ſhould be taking in making the Groove, that the Edges of it be ſmoothed down, ſo that they cannot wound in paſſing through the *Urethra*. The Extremity ſhould alſo be open, otherwiſe it will be ſometimes difficult to withdraw the Staff, when the Gorget is introduced, and preſſes againſt the End of it.

Theſe Inſtruments, are uſually made with a greater Bending than I have here repreſented; but I think this Shape more like that of the *Urethra*, and rather more advantageous for making the Inciſion.

D. The Yoke, an Inſtrument to be worn by Men with an Incontinence of Urine: It is made with Iron, but for uſe muſt be covered with Velvet: It moves upon a Joint at one End, and is faſtened at the other by Catches at different Diſtances placed on a Spring, as will be eaſily underſtood by the annexed Print. It muſt be accommodated to the Size of the *Penis*, and be taken off whenever the Patient finds an Inclination to make Water. This Inſtrument is exceedingly uſeful, becauſe it always

ways anſwers the Purpoſe, and ſeldom galls the Part, after a few Days wearing.

PLATE V.

The EXPLANATION.

A. A ſmall Catheter made of Silver. This Inſtrument is hollow, and ſerves to draw off the Urine when under a Suppreſſion: It is alſo uſed in the high Operation to fill the Bladder with Water: Near its Extremity, are two Orifices, through which the Water paſſes into its Cavity. Care ſhould be taken that the Edges of theſe Orifices are quite ſmooth.

B. The Knife uſed in cutting for the Stone: It is the ſame I have already deſcribed; but I thought it might not be improper to repeat the Figure with the Alteration of a Quantity of Tow twiſted round it, which makes it eaſier to hold when we perform the Lateral Operation, and turn the Edge upwards to wound the proſtate Gland.

C. A Female Catheter, different from the Male Catheter, it being almoſt ſtraight and ſomething larger.

D. A Silver-wire to paſs into either Catheter, for the removing any grumous Blood or Matter that clogs them up.

PLATE

PLATE VI.

The EXPLANATION.

A. The Gorget uſed upon Men in the Lateral Operation.

B. The Gorget uſed upon Children under five Years of Age in the Lateral Operation.

A Gorget between the Sizes of theſe two, will be fit for Boys from five Years of Age to fifteen or ſixteen

Theſe Inſtruments are hollow for the Paſſage of the Forceps into the Bladder, and their Handles lie ſlanting, that they may the more readily be carried through the Wound of the Proſtate, which is made obliquely on the left Side of it. The Beak at the Extremity of the Gorget, muſt be ſmaller than the Groove of the Staff which is cut upon, becauſe it is to be received in the Groove. Care ſhould be taken, that the Edges of the Gorget near the Beak are not ſharp, leſt inſtead of dilating the Wound, as it ought, it ſhould only cut on each Side when introduced; in which Caſe, it would be difficult to carry the Forceps into the Bladder.

C. A.

C. A Gorget, with its Handle exactly in the Middle; this ſhaped Inſtrument is uſed in the old Way. All the Gorgets ſhould be made of Steel.

PLATE VII.

The EXPLANATION.

A. The Forceps for extracting the Stone. Theſe are repreſented a little open, that the Teeth may be better ſeen within-ſide.

This Inſtrument muſt be of different Sizes for different Ages and Stones, from the Length of that in the Copper-plate, to one of near a Foot long; but the Forceps of about eight Inches long will be found moſt generally uſeful. The number neceſſary to be furniſhed with, will be four or five.

Great Care ſhould be taken by the Makers of this Inſtrument, that it move eaſily upon the Rivet, that the Extremity of the Chops do not meet when they are ſhut, and particularly that the Teeth be not too large, leſt in entering deep into the Stone they ſhould break it: It is of conſequence alſo that the Teeth do not reach farther towards the Joint than I have here repreſented, becauſe a ſmall Stone, when received into that Part, being held faſt there, would di-

late the Forceps exceſſively, and make the Extraction difficult; on which account, the Inſide of the Blades near the Joint ſhould be ſmooth, that the Stone may ſlip towards the Teeth.

B. A Director made of Steel, uſed for the Direction of the Gorget, in the Extraction of the Stone from Women.

C. A Scoop to take away the Stone when it is broken into ſmall Pieces like Sand. This Inſtrument is made of Steel.

CHAP. XXIV.

Of the EMPYEMA.

THE Operation for the *Empyema* generally implies an artificial Opening made into the Cavity of the *Thorax*, by which we evacuate any Fluid that lies there extravaſated, and is become dangerous by its Weight and Quantity. The Fluids deſcribed as neceſſary to be voided by this Operation, are Blood, Matter, and Water.

When Blood is the Fluid, ſuppoſed to require Evacuation by this Method, 'tis always extravaſated through ſome Wound of the Veſſels of the Lungs or *Thorax*, and being diſcharged in great Quantities on the Dia-

Diaphragm, it is ſaid to oppreſs Reſpiration till let out by ſome convenient Opening, made in the moſt depending Part of that Cavity, which is the only kind of Perforation into the *Thorax* diſtinguiſhed by the Name of the *Operation for the Empyema*: But though this Opening is univerſally recommended in the Caſe here ſtated, yet we meet with few or no Examples where it has been practiſed for a mere Extravaſation of Blood; and I ſhould think it can hardly ever be adviſeable on this Account: For if we perform it immediately after the Accident, and during the Hæmorrhage, the Opening made at the Bottom of the *Thorax*, might probably make way for a dangerous Effuſion of Blood, which perhaps would otherwiſe be choked up and ſtopped for want of a ready Iſſue; and if we wait till the Hæmorrhage ceaſes, it becomes needleſs, becauſe the Blood not only for the moſt part, finds ſome Vent by the external Wound, if left open, but is conſtantly ſpit up the *Trachea*; ſo that had we no farther Proofs of this abſorbent Power in the Lungs, we might from hence be perſuaded of the Probability of its being more ſafely carried off ſo, than by any ar-

tificial Opening we can poſſibly contrive in the *Thorax*.

Or if it be thought that the extravaſated Blood, being coagulated in the *Thorax*, cannot be taken up by the Veſſels of the Lungs, yet even in that caſe, the Operation uſually practiſed will not anſwer the Purpoſe, for beſides the poſſibility of the Lungs adhering to the *Pleura* in the place of Inciſion, which would abſolutely prevent any Advantage from it, the Depth and Narrowneſs of the Orifice, and its Height above the Diaphragm, on which the congealed Blood is ſuppoſed to lie, will make the Succeſs at beſt but very precarious.

To empty the *Thorax*, in a Rupture of any Veſſels which open into it, Bleeding is very neceſſary, which not only ſtops the Hæmorrhage, by abating the Force of the Circulation; but likewiſe, by unloading the Veſſels of their Contents, makes them more fit to receive the extravaſated Fluid by Abſorption: gentle Evacuations and Pectorals are alſo very ſerviceable, and a low Diet is abſolutely neceſſary.

The Rules laid down in ſome Books for diſtinguiſhing if a Wound penetrates, have led Practitioners into miſchievous Methods,

thods, by adviſing them to examine theſe Wounds with the Probe, or for more certainty the Finger; which if rudely uſed, ſometimes even tear into the *Thorax*, always force or preſs the Parts too much, and often ſeparate the Lungs from the *Pleura*, when they happen to adhere; all which Violences will produce Abſceſſes there, eſpecially if the Part be afterwards dreſſed with large Tents, or filled with any active Injection, both which were formerly applied with a View to deterge the Cavity of the Wound, but now ſeem to be exploded in favour of more ſuperficial Dreſſings; the Advantages of which Method, in my Opinion, cannot be too much inculcated.

But what I have here advanced concerning the Excellence of ſuperficial Applications, without dilating the Wound, to make way for the Iſſue of the Blood or ſucceeding Matter, muſt be conſidered with regard to Punctures or Inciſions by ſharp Inſtruments, not followed with a great Diſcharge: For where the Wound is made by Fire-arms, the Method of Practice muſt be ſometimes altered; becauſe not only Sloughs, and great Suppurations enſue, but very often Pieces of the Shirt or Coat are carried in with the Bullet, which will per-

haps require an Enlargement of the Wound, in order to be freely diſcharged; though even upon this Account, there will be no Occaſion to make an Opening at the Bottom of the *Thorax*, ſince the more Dilatation of the Wound will more readily give vent to the *Pus* and extraneous Bodies, than an Orifice made lower; becauſe the Lungs being inflamed by the Wound, will generally adhere to the *Pluera*, and break off the Communication between the Abſceſs and the Cavity below it. In dreſſing the dilated Wound, Care muſt be taken to apply the Doſſils with ſuch Preſſure only, as ſhall be ſufficient to keep open the external Orifice; and not to croud them into the *Thorax*, ſo as to lock up that Matter, which the very Deſign of Dilatation, is to give a Diſcharge to.

The ſecond Circumſtance in which this Operation takes place, is a Rupture of Matter from the *Pleura*, *Mediaſtinum* or Lungs, into the Cavity of the *Thorax*, where accumulating, it at length proves fatal for want of a Diſcharge. It is true that the Caſe occurs but very ſeldom, where the Operation is neceſſary; becauſe in moſt Abſceſſes of the *Thorax*, the Matter is uſually ſpit up as faſt as it is generated, and in the

the Diſſection of ſuch, who have died of this Species of Conſumption, we rarely find much extravaſated *Pus* in the Cavity, tho' a great Portion of the Lungs be deſtroyed: However as I have intimated, there are a few Examples which require the Operation: and they may be diſtinguiſhed by the following Symptoms. The Patient is obliged to lie upon the diſeaſed Side, or in caſe there is Matter in both Cavities of the *Thorax*, on his Back; becauſe the *Mediaſtinum* can ſeldom ſupport the Weight of the incumbent Fluid, without ſuffering great Pain; but this Rule is not certain, it ſometimes happening that the Patient can lie with eaſe on that Side, where there is no Fluid. Another Symptom of extravaſated Matter, is an evident Undulation of it, ſo that in certain Motions, it may be heard to quaſh. For the moſt part too upon careful Enquiry, an *Oedema*, or at leaſt a thickening of ſome Portion of the Intercoſtal Muſcles will be diſcovered. And laſtly, if there be much Fluid, it will be attended with a preternatural Expanſion of that Side of the Cheſt, where it lies. When therefore theſe Signs appear after a previous *Pleuretic* or *Pulmonary* Diſorder, and the Caſe has been attended with the Symptoms of a Suppu-

ration, it is moſt probably owing to a Collection of Matter: though the Patient will alſo labour, under a continual low Fever, and a particular Anxiety from the Load of *Fluid*.

I have here deſcribed the Abſceſs as breaking into the Cavity of the *Thorax*; but generally ſpeaking, in an Inflammation of the *Pleura* or Lungs, an Adheſion of both enſues; in Conſequence of which, Nature finds a Diſcharge outwardly, it being moſt frequent for Abſceſſes of the *Pleura* and intercoſtal Muſcles, and not uncommon even for Abſceſſes of the Lungs, to break externally. In caſe of an Adheſion, no farther Operation is required than opening the Tumour when ſuppurated, with a Lancet; and if the Diſcharge be of ſo great as to forbid the healing the external Ulcer, it may be kept open with a hollow Tent; by which manner of Treatment many have lived a long Time with a running Fiſtula.

The laſt Sort of Fluid ſaid to require Iſſue from this Operation, is Water, which however very ſeldom collects in ſuch manner as to become the proper Subject of the Operation; for if the Dropſy of the *Thorax* be complicated with an *Anaſarca*, or even *Aſcites*, it is certainly improper, and indeed it

it can hardly ever take place, but where the Diſtemper is ſingle, and takes its Riſe from the ſame ſort of Diſorder in the Lymphaticks of the *Pleura*, as the *Hydrocele* does from thoſe of the *Tunica Vaginalis*. The Symptoms of this Dropſy are, a ſmall Cough without Spitting, a little ſlow Fever from the Diſturbance of Reſpiration; ſometimes too the Water by a ſudden Jerk, may be heard to quaſh, and generally ſpeaking its Weight upon the *Diaphragm* and *Mediaſtinum* are ſo troubleſome as to oblige the Patient to ſtoop forward when in an erect Poſture, and to turn upon the affected Side when he lies down; for the ſame Reaſon, when there is Water in both Cavities of the *Thorax*, he is forced to lie on his Back.

The Manner of operating, whether it be for the Diſcharge of Matter or Water, is to pitch upon the moſt depending Part of the *Thorax*, which ſome have ſuppoſed to be between the eighth and ninth Rib, and others between the ninth and tenth, at ſuch a Diſtance from the *Vertebræ*, that the Depth of the Fleſh may not be an Impediment to the Perforation: This Diſtance is determined to be about a Hand's Breadth; and here, with a Knife, Sciſſars, or Trocar,

car, we are ordered to make the Perforation; but in doing it, there are a great many Difficulties: In fat Perſons, 'tis not eaſy to count the Ribs, and the Wound will be very deep, and troubleſome to make; it is hardly poſſible to eſcape wounding the intercoſtal Artery, which runs in this Place between the Ribs; or if you avoid it, by cutting cloſe to one of the Ribs, a Caries of the Bone will follow from the Preſſure of the Tent employed afterwards: Again, the Inflammation of the Wound may poſſibly affect the Diaphragm, which is ſuppoſed almoſt contiguous to it, and this may prove of very ill Conſequence; ſo that, upon the whole, without any farther Recital of Objections to the *Empyema* thus performed, it cannot appear an adviſeable Operation. But if the only Advantage propoſed by this Situation of the Wound, be derived from its Dependency; the Purpoſe of diſcharging the Fluid will be as well anſwered, by an Opening between the ſixth and ſeventh Rib, half way from the *Sternum* towards the Spine; which by laying ourſelves down, becomes in effect as depending an Orifice, as the other in ſitting up; and by an Opening made in this manner, we avoid all the Inconveniencies in the other

other Method: For in this part of the *Thoraz*, there is very little Depth of Muſcles; the Artery lies concealed under the Rib; and the Diaphragm is at a great Diſtance; ſo that none of thoſe Miſchiefs can enſue I have ſuppoſed in the other Method; which conſequently will give it the Preference. The Opening is beſt made with a Knife, and ſhould be about an Inch long thro' the Skin, and half an Inch, through the ſubjacent Muſcles: tho' to make the Inciſion with leſs Riſk of wounding the Lungs, it may be adviſeable to dilate it with the blunt-pointed Knife (as is practiſed in the Operation for the *Bubonocele*) after having made a ſmall Puncture with a common Knife. If it ſhould be objected, that the Fluid cannot be diſcharged by this Oriſice, while we are erect, whereas by making it in the lower Part of the *Thorax*, it will be continually draining; I think it may be anſwered, that after it is once emptied, it will hardly in twelve Hours be generated in greater Quantity than what will lie upon the Diaphragm below the Opening made even by that Operation, and conſequently cannot be more readily diſcharged by one Orifice, than the other. The Treatment of the Wound will be according

to

to the Nature of the Diſcharge. If after a few Days, there appears no Drain, you may let the Orifice heal up, but if it continues, it may be kept open with a ſhort ſilver *Canula*, 'till ſuch time as an Alteration in that Circumſtance will give us leave to cicatrize with Safety.

CHAP. XXV.

Of Encyſted TUMOURS.

THESE Tumours borrow their Names from a Cyſt or Bag, in which they are contained; and are farther diſtinguiſhed by the Nature of their Contents: If the Matter forming them reſembles Milk-Curds, the Tumour is called *Athemora*; if it be like Honey, *Meliceris*; and if compoſed of Fat, or a ſuety Subſtance, *Steatoma*. The two firſt are not readily diſtinguiſhed from one another, but their Difference from the *Steatoma* is eaſily learnt by their Softneſs and Fluctuation. Theſe Tumours appear in every Part of the Body, and in Places where there are no Glands; which, with the Circumſtances of their Compoſition continuing always the ſame from their firſt Formation, agrees but little with an Opinion ſome of the Moderns are ſo fond of, that

that this kind of Swelling is an obſtructed Gland, whoſe Membrane forms the Cyſt, and whoſe Fluids, when they burſt out of their Veſſels after a long Obſtruction, make the Matter contained.

The *Steatoma* is never painful, 'till by its Weight it grows troubleſome, nor is it a Mark of general Indiſpoſition of Body; ſo that the Extirpation ſeldom fails of Succeſs. The Size of ſome of them is very large, frequently weighing five or ſix Pounds, and there have been Inſtances of their weighing above forty.

When the *Steatoma* is irregular in its Surface, with Eminencies and Depreſſions, it is ſuety; whereas the fat one has for the moſt part a uniform ſmooth Outſide. The Operation for a *Steatoma* will be underſtood by the Deſcription of that for the Scirrhus.

The *Atheroma* is much more common than the *Meliceris*, at leaſt, if all encyſted Tumours with Matter not curdled, may in compliance with Cuſtom, be called ſo: Theſe are more frequent, and grow larger than thoſe where the Matter is curdled, being often attendant on ſcrophulous Indiſpoſitions, which makes them more difficult of Cure.

The

The Cyſts of theſe Tumours, with the Skin covering them, after a certain Period of Growth, reſiſting any further Enlargement, do frequently inflame and break; but this Opening is not ſo advantageous for the Cure, as Extirpation by the Knife, which ſhould be done in the Infancy of the Swelling. When the Tumours are no bigger than a ſmall golden Pippin, they may be diſſected away from under the Skin, by making a ſtraight Inciſion only through it; but if they exceed this Bulk, an oval piece of Skin muſt be cut thro' firſt, to make room for the Management of the Knife and taking away the Tumour; in which caſe, it will be adviſeable to take off the upper Portion of the Cyſt with the Skin; and then by the Help of a Hook to diſſect away as much of the Remainder of it as can be conveniently, which is a leſs painful, and more ſecure Method than deſtroying it afterwards with Eſcharoticks: This Rule is to be obſerved, when the Cyſt runs ſo deep amongſt the Interſtices of the Muſcles, as to make it impoſſible to remove the whole of it, where if we cut off a great Quantity, the reſt uſually comes away in Sloughs and Matter. I once opened a remarkable *Atheroma* of this kind; it was about

about as big as the Crown of a Man's Hat, and lay underneath the Pectoral Muſcle (as all I ever met with on the Breaſt have done) extending itſelf towards the Armpit, amongſt the great Veſſels, and preſſing againſt the Clavicle: I cut away a large circular Piece of the Skin, Pectoral Muſcle, and Cyſt, but did not dare to touch the lower Part of it, which I could not remove without laying the Ribs bare; however, it ſeparated in the Digeſtion of the Wound, which for ſome time diſcharged exceſſively, and the whole Cavity filled up, leaving him the Uſe of his Arm almoſt perfect: After this, two or three ſmall Splinters of the Clavicle worked away through the Skin, but without any great Inconvenience.

The Ganglion of the Tendon is an encyſted Tumour of the *Meliceris* kind, but its Fluid is generally like the White of an Egg; when it is ſmall, it ſometimes diſperſes of itſelf; Preſſure, and ſudden Blows, do alſo remove it, but for the moſt part, it continues, unleſs it be extirpated: It is no uncommon Caſe to meet with this Species of Ganglion, running under the *Ligamentum Carpale*, and extending itſelf both up the Wriſt and down to the Palm of the Hand.

Hand. The Cure of this Diſorder cannot be effected but by an Inciſion through its whole Length and dividing the *Ligamentum Carpale*, which I have performed ſucceſsfully ſeveral times.

The Dreſſing in theſe Caſes does not at all differ from the general Methods of treating Wounds.

CHAP. XXVI.

Of the Amputation of the Cancer'd and Scirrhous BREAST.

THE Succeſs of this Operation is exceedingly precarious, from the great Diſpoſition there is in the Conſtitution after an Amputation, to form a new Cancer in the Wound, or ſome other Part of the Body. When a Scirrhus has admitted of a long Delay before the Operation, the Patient ſeems to have a better Proſpect of Cure without danger of a Relapſe, than when it has increaſed very faſt, and with acute Pain. I cannot however be quite poſitive in this Judgment, but upon looking round amongſt thoſe I know who have recovered, find the Obſervation ſo far well-grounded. There are ſome Surgeons, ſo diſheartened by the Ill-ſucceſs of this Operation

ration, that they decry it in every Caſe, and even recommend certain Death to their Patients, rather than a Trial, upon the Suppoſition it never relieves; but the Inſtances, where Life and Health have been preſerved by it, are ſufficiently numerous, to warrant the Recommendation of it.

The Scirrhus may be diſtinguiſhed, by its want of Inflammation in the Skin, its Smoothneſs and Slipperineſs deep in the Breaſt, and generally, by its pricking Pain, which as it is more or leſs, increaſes the Danger accordingly; tho' there are ſome few with little or none in the Beginning: As the Tumour degenerates into a Cancer, which is the worſt Degree of Scirrhus, it becomes unequal and livid, and the Veſſels growing varicous, at laſt ulcerates.

In extirpating the Scirrhus, if it be ſmall, a longitudinal Inciſion will dilate ſufficiently for the Operation, but if too large to be diſſected out in that manner, an oval Piece of Skin muſt be cut thro' firſt, the Size of which is to be proportioned to that of the Tumour; for example, if the Swelling is five Inches long, and three broad, the oval Piece of Skin cut away muſt be nearly of the ſame Length, and about an Inch and a half in Breadth. In taking off

the whole Breaſt, the Skin may be very much preſerved, by making the Wound of it a great deal leſs than the Baſis of the Breaſt, which muſt be carefully cleared away from the Pectoral Muſcle: This is not difficult to do, becauſe all theſe Scirrhuſes being enlarged Glands, are encompaſſed with their proper Membranes, which make them quite diſtinct from the neighbouring Parts, and eaſily ſeparable; at leaſt this is the Caſe, when the Tumour is moveable; for ſometimes it adheres to the ſubjacent Muſcle, and that Muſcle to the Ribs; in which Circumſtance, the Operation is impracticable. When it is attended with Knots in the Arm-pit, no Service can be done by Amputation, unleſs the Knots be taken away; for there is no ſort of Dependance to be laid on their ſubſiding, by the Diſcharge of the Wound of the Breaſt: The Poſſibility of extirpating theſe Knots, without wounding the great Veſſels, is very much queſtioned by Surgeons; but I have often done it, when they have been looſe, and diſtinct.

The Bleeding of the large Arteries is to be ſtopped by paſſing the Needle twice through the Fleſh, almoſt round every Veſſel, and tying upon it, which will neceſ-

ſarily

farily include it in the Ligature. In order to diſcover the Orifice of the Veſſels, the Wound muſt be cleaned with a Spunge wrung out of warm Water.

The ſcirrhous Tumours which appear about the lower Jaw, are generally ſpeaking ſcrophulous Diſorders, that diſtinguiſh themſelves almoſt by the Circumſtance of fixing on the Salivary Glands. Theſe are very ſtubborn of cure, but not ſo bad as the Scirrhus, ſince they frequently ſuppurate, and heal afterwards: If they impoſtumate again after healing, 'tis for want of a good Bottom, which may ſometimes be procured by deſtroying their bad Surface with a Cauſtick. Beſides theſe, there is another Species of Scirrhus in the Neck, that ſucceeds better after Extirpation, than either of the former kinds; this is an Enlargement of the Lymphatick Glands, which run cloſe up by the Jugular Vein, and is diſtinguiſhable from Cancers of this Part, by its Moveableneſs, want of Pain, the Laxneſs of the Skin covering it, the ſmall Degree of Preſſure it makes on the *OEſophagus* and *Trachea*; and laſtly the good Habit of Body, as it ſeldom affects the Conſtitution, which Cancers here do very early, after their firſt Appearance. This Tumour, from its Situation,

requires great Exactneſs in the cutting off: the laſt I took away of this kind, I ſeparated from the Jugular Vein near the length of an Inch and a half: they ſometimes extend up to the Chin towards the Mouth, and occaſion a Diviſion of the Salivary Duct in operating, which proves very troubleſome to heal, but when all other Methods have failed, may be cured by a Perforation into the Mouth, through that Part of the Cheek where it is wounded, which by a Tent or ſmall Seton may be made fiſtulous; then by properly dreſſing upon the Outſide, the Oozing of the *Saliva* that Way will be prevented, and the external Orifice healed without Difficulty.

The Treatment of all theſe Wounds may be with dry Lint firſt, and afterwards as in the common inciſed Wounds.

CHAP. XXVII.

Of the Operation *of the* TREPAN.

THE Operation of the *Trepan*, is the making one or more Orifices, through the Scull, to admit an Inſtrument for raiſing any Pieces of Bone, that by Violence are beaten inwards upon the Brain; or to give

give iſſue to Blood or Matter, lodged in any part within the *Cranium*.

Fractures of the Scull are at all times very dangeous, not in conſequence of the Injury done to the *Cranium* itſelf, but as the Brain becomes affected either from the Preſſure of the fractured Bone, or that of the extravaſated Blood and Matter. If then the Symptoms excited by a Fracture, do ſometimes follow from a mere Extravaſation of Blood, as is the Caſe when the *Cranium* is not beaten inwards, it muſt likewiſe happen that a Rupture of the Veſſels of this Part without a Fracture, will alſo occaſion the ſame Diſorders: For this reaſon, the Operation may take place, where the Scull is not much offended, but only the Veſſels of the *Dura Mater*, the *Pia Mater*, or the Brain.

The Writers on this Operation, have deſcribed the different Diſorders in which it is uſeful, under a great Variety of Names; but thoſe few general ones, which all Surgeons are acquainted with, are quite ſufficient for the underſtanding the Nature of every Caſe that can happen.

When the *Cranium* is beaten inward, without any Fracture, it is called a Depreſſion; when very much broken, a Fracture;

or if broken and beaten in alſo, a Fracture with Depreſſion; if it is only cracked, without Depreſſion, though properly a Fracture, it is called a Fiſſure; if none of theſe Diſorders appear, where there is a Suſpicion of them, the Symptoms are imputed to a Concuſſion of the Brain. Theſe are the four Diſtinctions in uſe, and which fully comprehend all the others.

The Depreſſion of the *Cranium* without a Fracture, can but ſeldom occur, and then it happens to Children whoſe Bones are more pliable and ſoft than thoſe of Adults; I have met with one Inſtance of this myſelf in a Girl of ſeven Years of Age: when ſhe firſt received the Injury, ſhe had the Complaints of an oppreſſed Brain, but they ſoon went off; the Blow formed a large Tumour on the Parietal Bone, for which ſhe was put under my Care ſome Days after the Accident; I opened immediately into it, by cutting away a circular piece of the Scalp, and took out a great Quantity of grumous Blood lying underneath the *Perioſteum*; I then dreſſed the Depreſſion with dry Lint, and finding no Complaints come on, continued the ſame Method, 'till in about ſix Weeks ſhe was perfectly cured.

In Blows of the *Cranium*, requiring the uſe of the Trepan, the Marks of a Fracture are generally very evident, ſince the Scalp is often lacerated ſo much, as to expoſe it to our Sight: But if the Wound of the Scalp be ſo ſmall, as only to admit a Probe, we muſt judge then by the Feel of the Surface of the Bone, uſing the Caution of not miſtaking a Suture for a Fracture, which *Hippocrates* confeſſes he himſelf did; tho' for this frank Confeſſion of an Error, to prevent others being miſled, he is as much recommended to Poſterity, as for any of his other Qualities.

If there be no Wound of the Scalp, you muſt preſs about the Head with your Fingers, 'till the Patient complains of ſome particular Part, which in all likelihood is the place affected, and if the Scalp there be ſeparated from the *Cranium*, is almoſt infallibly ſo: The Symptoms of a Fracture, are, a Bleeding at the Ears and Noſe, a Loſs of Senſe, Vomitings, Drowſineſs, Delirium, Incontinence of Urine and Excrement; but what is moſt to be depended upon, is a Depreſſion of the Bone, or a Roughneſs on its Outſide; for all the other Complaints, not only happen to Concuſſions, which do well without the Application of a Trepan, but

likewiſe there are Fractures not attended with any of them, or at leaſt in a ſlight degree; ſo that theſe Symptoms alone, without Examination of that Part affected, are but an uncertain Rule to go by.

In Concuſſions without a Fracture, that produce the Symptoms here laid down, and do well afterwards, the Veſſels of the Brain and Membranes are only inflamed and dilated; or if they are ruptured, they abſorb the extravaſated Blood again; on which account, Nature ſhould be aſſiſted by plentiful Bleedings, Clyſters, and other Evacuations, and ſo in all Fractures where the Patient is not trepanned immediately; however, although People with Concuſſions in the violent Degree I have ſtated, do ſometimes recover, it is ſo very ſeldom, that there can be no Pretence, when they happen, for neglecting the Trepan, but not being able to learn in what Part the Concuſſion is. The Opportunities I have had of opening ſome People who have died under this Circumſtance, have ſufficiently convinced me how little is to be truſted to any other Method than an Opening for the Diſcharge of the Abſceſs, which by Confinement of Matter becomes very large, ſpreading over a great Quantity of the Brain before it kills.

Writers

Writers diſpute very much about the Poſſibility of the *Contra Fiſſure*, or a Fiſſure occaſioned on the Part of the Head oppoſite to that on which the Blow is given, or where the inner Table is fractured, while the outer one remains intire; but there are Hiſtories of Caſes, which if fairly ſtated, make it unqueſtionable; and this is moſt certain, that if the Complaint be at a Diſtance from where the Blow was received, there can be no Danger in Scalping, and applying the Trepan to that Part where the Pain is.

There are Surgeons, who ſay that the Veſſels of the *Diploe* do ſometimes by a Concuſſion break, and that the Matter making its Way through the inner Table of the Scull into the Brain, requires the Trepan; but I believe there is no very good Authority for this Aſſertion.

When we are aſſured of a Fracture or Depreſſion, though the Symptoms in a great meaſure go off, and notwithſtanding there are a few Hiſtories in Authors, where we read, that Patients have ſurvived without the Operation, it is in my Opinion always adviſeable to trepan as ſoon as poſſible, in order to prevent the ſpreading of the Abſceſs, which ſeldom fails to follow upon the Rupture of the Veſſels of the Brain and Mem-

Membranes, and for the moſt part in a few Days; tho' there are a great many Inſtances of Fractures, not bringing on a fatal Abſceſs, for a great Length of Time after the Accident.

I once trepanned a young Woman about a hundred Days after ſhe received the Blow; the lower Part of the Parietal, and upper Part of the Temporal Bones, were fractured and depreſſed; ſhe bled at the Noſe and Ears when ſhe firſt received the Injury, and had at times been drowſy, and in ſome little Pain, 'till towards the ninetieth Day, when the Symptoms of a compreſſed Brain came on ſtronger, and a ſmall time after, ſhe put herſelf under my Care; which, with the many Inſtances of the ſame kind to be met with in Authors, ſhow how little ſafe it is, to truſt to any Extravaſation or Depreſſion on the Brain doing well, without the Aſſiſtance of the Trepan.

The Manner of treating a Fracture of the *Cranium*, will be according to the Nature of the Fracture itſelf, and the Injury of the Scalp; if the Wound of the Head be torn into Angles, perhaps cutting off the lacerated Flaps will make room for the Saw; if the Bone be broken into ſeveral Pieces, the Pieces may be taken away with the Forceps;

ceps; or if ſome of the Scull be alſo depreſſed, the removal of the Pieces will, without perforating, make way for the Elevator to raiſe the depreſſed Part; but if the Fracture be not complicated with a Wound of the Scalp, or the Wound be too ſmall to admit of the Operation, which ſeldom fails to be the Caſe, then the Fracture muſt be laid bare, by taking away a large Piece of the Scalp. It is a faſhion with ſome Surgeons, to make a crucial Inciſion for this Purpoſe, which they prefer to the other Method, upon the Suppoſition that the Wound will more eaſily heal again after the Operation, by turning down the Flaps; and in caſe we find no Fracture, which ſometimes happens after ſcalping, that by making this ſpecies of Wound, an Exfoliation of the Bone and tedioufneſs of Cure will be avoided. But whoever has ſeen the Practice of the crucial Inciſion, muſt be ſenſible of the falſe Reaſoning uſed in its favour; for it ſeldom happens that we inquire for a Fracture of the Scull by ſcalping, but that the Scalp itſelf is contuſed, which Circumſtance generally bringing on a plentiful Suppuration, and the Matter lodging between the *Cranium* and Skin, not only prevent their immediate healing, but occaſion a Caries

Caries of the Bone, which is the Accident meant to be ſhunned by it; and frequently at laſt, the Lips of the Wound growing callous, require cutting off, to procure a Cicatrix. If then the Objection be good, to the crucial Inciſion, when no Operation is performed, it becomes of ſo much more force when we are aſſured of uſing the Trepan, that I think it is indiſputably right at all times, to take off the Scalp when we lay bare the *Cranium* with a view to the Operation, which ſeldom fails to granulate with Fleſh in a few Days, if dreſſed only with dry Lint, and rarely grows carious, if not affected by a great Diſcharge of Matter from the Brain, and even in that caſe but ſuperficially; or if after it is thus expoſed, new Fleſh ſhould not generate upon its Surface, the Growth of it may be quickened by boring little Orifices into the Subſtance of the Bone, or raſping it with the Rugine. The form of the piece taken away may be nearly circular, and to be better aſſured of the courſe of the Fracture, it will be proper it ſhould be of the whole length of it. I believe there are few will care to expoſe ſo much naked Scull, but whoever knows the great Advantage and the little Danger of it, will not heſitate. When the Scalp is removed,

moved, the *Periosteum* must be raised, and the Arteries immediately tied, which will make way for the Operation to be directly performed; though the Effusion of Blood has been esteemed so troublesome in this Part, as to have made it almost an universal Practice to postpone the use of the Trepan to the Day after; but the Apprehension is without foundation; for if two or three of the larger Vessels are tied, the others may easily be stopped with a little dry Lint, and the Operation take place without any Inconvenience, which I have always done myself, and would recommend to others, considering how urgent the nature of the Distemper is, and that less than twenty-four Hours is often the Difference between Life and Death, when the Brain is much pressed by a fractured Bone.

Before the Application of the Trepan, it is to be remembered there are certain Places on the Scull, where it cannot be used with so much Safety as on others; the whole length of the Sagittal Suture, down to the Nose, is always mentioned as one where the Perforation is dangerous, because of the Spine of the *Os Frontis*, and the course of the superior longitudinal *Sinus* under this Part, which it is supposed would be necessarily

ſarily wounded by the Saw, and in conſequence deſtroy the Patient by the Hæmorrhage; but though a Perforation may, contrary to the general Opinion, be made over the *Sinus* without offending it, and even if it was wounded, the Effuſion of Blood would not in all probability be mortal, (as I have ſeen in two Inſtances,) yet at beſt it would be very troubleſome; and ſince we are not ſtraitened in that part of the *Cranium* for room, I think it is adviſeable to forbear operating in this Place. The bony *Sinuſes* of the *Os Frontis*, forbid the uſe of the Trepan near the Orbits of the Eyes; therefore if it ſhould be depreſſed near thoſe Cavities, the Surgeon muſt be careful to perforate either above, or on one ſide of the Fracture; for ſawing below it, will only lead into the *Sinus*, and anſwer no Purpoſe in the deſign either of giving a Diſcharge to the Matter from the Brain, or an opportunity to elevate the Depreſſion; nay, perhaps leave an incurable Fiſtula, if the Patient eſcapes with Life.

The *Os Occipitis* being very uneven, both in its internal and external Surface, makes Trepanning there almoſt impracticable; beſides, the great *Sinuſes* run about ſo much of it, as hardly to afford ſpace to perforate with-

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without danger of wounding them; but then it is so defended from Injuries by its Situation and Strength, that Fractures do not happen to it so often as to the other Bones of the *Cranium*; and when they do, for the most part, they become so soon mortal, by affecting the *Cerebellum* which it sustains, that the Operation is seldom required in this case. Indeed the upper Angle of this Bone lies above the *Cerebellum*, and when fractured or depressed, is not attended with so immediate Danger; but when this happens, the course of the longitudinal *Sinus* down the middle of it, and the neighbourhood of the lateral *Sinuses* beneath it, make it advisable to trepan at the lower part of the *Os Parietale*, or at least upon or just below the Lambdoidal Suture, so that the Perforation of the *Os Occipitis* can hardly ever be proper.

It may be observed I have spoken of Wounds of the *Cerebellum* as proving inevitably mortal, when affected by a Fracture: How long a Patient may continue with Matter on its Surface, I cannot take upon me to say, but I believe there is no Instance of a Cure after an Abscess; and as for Wounds of it, they are generally almost instantaneous Death; whereas sometimes great Portions of

of the *Cerebrum* have been carried off, or deſtroyed, without any notable Inconvenience. From this great Difference of Danger, in Affections of the *Cerebrum* and *Cerebellum*, has ariſen the Opinion, that the firſt, is the Organ of Animal Motion only, and the other, of Vital.

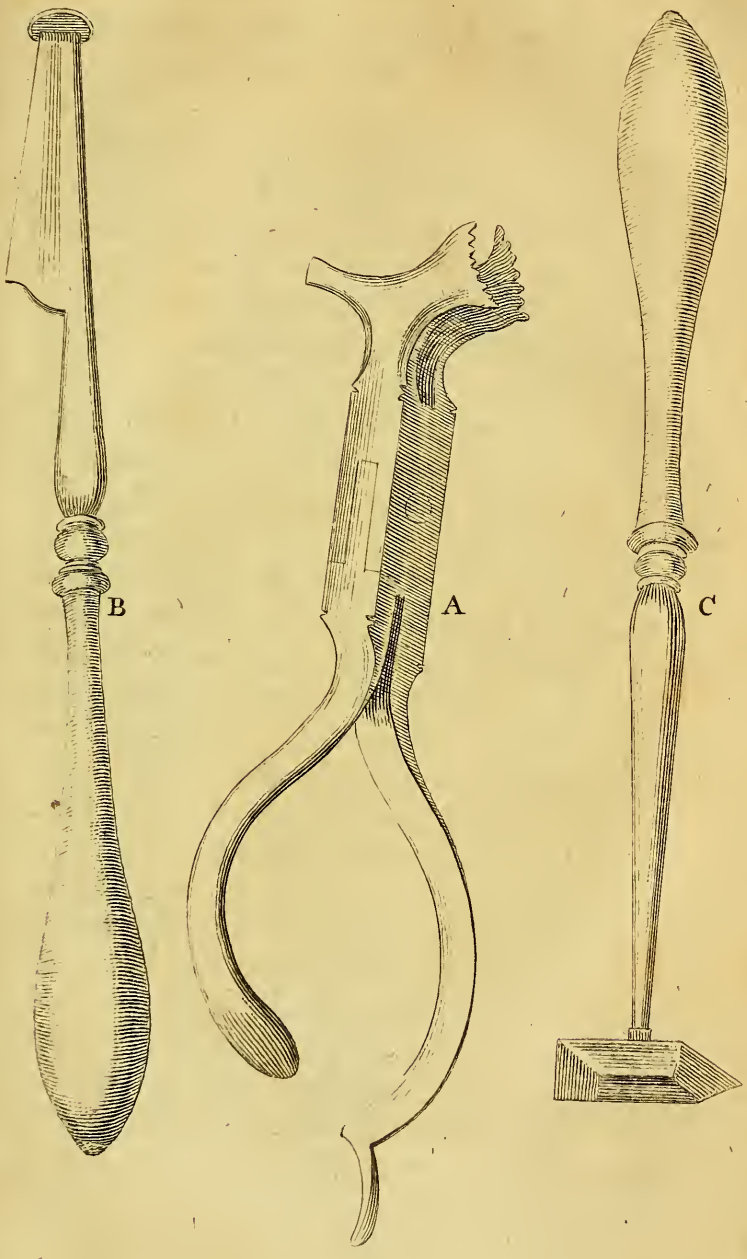
The Places then unfit to admit the Saw, are the three I have deſcribed; that is, the Sagittal Suture; that Part of the *Os Frontis* near the Orbits of the Eyes; and the *Os Occipitis*. But when a Fracture happens in any other part above the Ear, there is no Objection to the Operation. When there is only a ſmall Fiſſure without any Depreſſion or Motion in the Bone, the Trepan may be applied on the Fiſſure itſelf, which will more readily give vent to the Blood or Matter underneath, than if made at a diſtance. If the Fiſſure be large, and the Bone weakened or depreſſed, the Trepan muſt be applied on one ſide of it, but ſo as to make it a Part of the Circumference of the ſawed Piece; if the Fracture run upwards, it will be eligible always to perforate near its bottom, becauſe the dependency of the Orifice will give better Iſſue to the Matter, though the ill-grounded Apprehenſion of the Brain falling out there, has made many

many eminent Surgeons contradict this Rule in their Practice. If by making one Orifice, you cannot raise all the depressed Part, you must make a second and a third, and continue doing so, 'till you have reduced the whole *Cranium* even: there is frequently occasion to repeat it twice or thrice, and it has been done twelve times, nay oftener, with Success, which I mention, to shew the little danger there is, either in sawing the Scull, or exposing the *Dura Mater* and Brain, when the Pressure is taken off. Indeed the mischief of laying the Brain bare, is so small, compared with a Concussion of it, or an Abscess from pent-up Matter, that those Fractures of the Scull, where the Bone is broken into Splinters the whole extent of it, and can be taken away, much more readily do well, than a simple Fissure only, where the Abscess cannot discharge itself freely; for which reason, though the depressed Fracture may be raised by the means of one Orifice, yet if it is of a considerable length, it will be almost absolutely necessary to make one or two more Openings, for the convenience of Discharge; since for want of this, we see Abscesses increase daily in their quantity of Matter, and at the end of a few Weeks, carry off the

Patient. Thoſe that are converſant in the Diſſection of Perſons dying of this Diſorder, will be convinced of the force of this Reaſoning, ſince they not only conſtantly find *Pus* lodged on the Brain, as far as the Fiſſure extends, but all round about it, ſometimes ſpreading over a quarter of its Surface.

In Concuſſions of the Brain without a Fracture of the *Cranium*, if the Trepan be applied, and vaſt Diſcharges enſue, it will be alſo convenient to make more Perforations into the Abſceſs and the neighbourhood of the Abſceſs, the Situation of which, will be eaſily gueſſed by the direction of the ſtream of Matter. And here it is to be obſerved, that Abſceſſes which enſue from a Concuſſion, are generally more extenſive and dangerous, than thoſe which accompany a Fracture with Depreſſion; for in a Fracture, the yielding of the Bone deſtroys, in a great degree, the Force of the ſtriking Body, and prevents any violent Commotion of the Brain; ſo that what the Brain ſuffers, reſults chiefly from the Preſſure of the incumbent Bone, and the Laceration of the Veſſels, near the Fracture; whereas when the *Cranium* reſiſts the Shock, all, or great Part of the *Cerebrum* ſuſtains the Concuſſion, and is often impoſtumated or inflamed

almoſt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almoſt in its whole Dimenſion, as we find upon opening thoſe who die of this Diſorder.

The Manner of Trepanning is this: Having fixed your Patient's Head ſteady, either on the Bolſter of a Bed, or by placing him in a low Chair; with the Pin of your Saw, mark the Center of the Piece of Bone to be taken out; then with the Perforating Trepan, make an Orifice deep enough to receive the Pin, which being fixed in it, will prevent the Saw from ſlipping; and thus you are to continue ſawing, 'till the Impreſſion made will preſerve the Steadineſs without the Pin, when it is to be taken away, for fear of its wounding the Brain before the Saw has entered through the *Cranium*, which it would do at laſt, becauſe of its Projection. In working through the Bone, the Teeth of the Saw will begin to clog, by that time you arrive to the *Diploe*, wherefore a Bruſh muſt be ready to clean it every now and then, and with a pointed Probe you muſt clear away the Duſt in the Circle of the trepanned Bone, obſerving if it be deeper on one Side than the other, to lean afterwards on that Side where the Impreſſion is leaſt, that the whole thickneſs may be ſawed thro' at the ſame time. To

do all this with leſs Interruption, it will be proper to have two Saws of exactly the ſame Diameter, that an Aſſiſtant may be bruſhing one while you operate with the other. We are adviſed to ſaw boldly, 'till we come to the *Diploe*, which it is ſaid, will always diſtinguiſh itſelf by the Bloodineſs; but however this is not a certain Mark to go by; for tho' where there is a *Diploe*, it will manifeſt itſelf by its Bloodineſs, yet ſometimes the Scull is ſo very thin as not to admit of any; in which caſe, if an Operator ſhould puſh on his Inſtrument in expectation of meeting with this Subſtance, he would unwarily wound the Brain. This is not very often the caſe, but however often enough to put a Man on his guard, and make him enquire whether the Bone be looſe after a little ſawing, which is the only Rule we go by when we have paſſed thro' the *Diploe*, and may as well be attended to, before coming at it, without any conſiderable loſs of Time. When it is quite ſawed through and lies looſe, it may be taken away with the Forceps, contrived for that Uſe; and if the lower Edges of the Orifice, next to the *Dura Mater*, are ſplintered, they may be ſcraped ſmooth with a Lenticular.

Theſe

Theſe are the chief Proceſſes of the Operation of the Trepan; the only thing remaining to be done, is with an Elevator introduced at the Orifice to raiſe the Depreſſion, or broken Splinters, if they cannot otherwiſe be laid hold of, and to draw out the grumous Blood, or any other extraneous Body. If the *Dura Mater* be not wounded or torn, an Inciſion muſt be made thro' it, to give way to the Blood or Matter, which almoſt certainly lie underneath it, if the Symptoms have been bad, and none has been diſcharged from between the *Cranium* and *Dura Mater:* Though it has been lately obſerved that an Abſceſs will ſometimes be formed in the Subſtance of the Brain; and therefore if the Puncture of the *Dura Mater* does not procure an Evacuation of the Matter, and the Symptoms of a Suppuration are ſtill urgent, it will be adviſeable to make a ſmall Inciſion with a Lancet into the Brain itſelf.

I have uſed the Word Trepan all along, for the ſake of being better underſtood; but the Inſtrument I recommend is a Trephine, the Advantages of which, as alſo that of a cylindrical Saw, or one nearly cylindrical, are deſcribed in the Explanation of the Copper-Plate.

With regard to the Dreſſings of theſe Wounds, I think it is very certain, that as the greateſt part of the Evil proceeds from the Quantity and Preſſure of the Matter, whatever approaches towards the Nature of a Tent, and increaſes its Quantity and Preſſure, by locking it up, muſt be pernicious: Therefore, I would exclude the uſe of all Syndons whatever; the haſty Application too of Spirits of Wine, which is ſo commonly adviſed, cannot be proper; as they are not only unfit for Inflammations in general, but alſo criſp up the Veſſels of the *Dura Mater* and Brain, and ſtopping the Suppuration, ſometimes produce a Gangrene. Since then a cloſe Application is inconvenient, and whatever Good there may be in Topical Medicines, it cannot for the moſt part be communicated to the Abſceſs, by reaſon of its extent beyond the Orifice, the beſt Remedy will be dry Lint only, which muſt be laid on looſely to give vent to the Matter, and be repeated twice a-day 'till the Diſcharge is leſſened, when once in twenty-four Hours will be ſufficient to the finiſhing of the Cure, which will be ſomething retarded by the Exfoliations that ſometimes follow this Operation. The Patient afterwards may wear a Plate of Tin upon the

the Scar, to defend it from Blows or any accidental Injury.

PLATE VIII.

The EXPLANATION.

A. The Perforator, commonly called the Perforating Trepan. With this Inſtrument, an Orifice is uſually made for the Reception of the Pin, on the Center of the Piece of Bone that is to be taken away, in the Operation of Trepanning; though if the Pin be very ſharp, and project but little beyond the Teeth of the Saw, as in that marked with the Letter *B*, the Perforator would be needleſs; but as the Point of the Pin preſently grows blunt with Uſe, and in that caſe, it is difficult to fix the Saw, I think it adviſeable to have this Inſtrument in readineſs. It is alſo handy for boring into the Subſtance of the Bones, in order to promote a Granulation of Fleſh on their Surfaces: When it is made uſe of it muſt be received and faſtened in the Handle *C*.

B. The Crown, or Saw of the Trepan, with the Pin appearing juſt beyond the Extremities of the Teeth. It may be obſerved, the Shape of this Saw is cylindrical, differing from thoſe in uſe which are all conical,

and ſome, in a very great Degree. Surgeons have generally conceived great Advantages to ariſe from this Form: Firſt, as a Circumſtance of the utmoſt Importance, they have imagined there would be danger of injuring the Brain, by ſawing too ſuddenly through the *Cranium*, if the Enlargement of the Saw did not increaſe the Obſtruction, in proportion as they advanced towards it, and make the working of the Inſtrument exceedingly ſlow. It has alſo been believed, that unleſs the Saw was ſmaller near the Teeth, than towards its Baſis, it would be impoſſible to incline it on any part where it had not made ſo deep an Impreſſion as in others, in conſequence of which, one ſide of the Circle would be ſawed through, and the Membranes or Brain injured, while on the other, perhaps the Saw would not have penetrated through the firſt Table of the *Cranium*: The laſt remarkable Argument in favour of the Conic Saw, is, that it more readily admits, and afterwards retains the ſawed piece of Bone in its Cavity: But I think all the Advantages attributed to this Figure are almoſt imaginary; and the great Labour of working ſo ſlowly and difficultly, is not only very inconvenient to an Operator, but by no means ſerviceable to the Ope-

Operation; for notwithſtanding the Saw be Cylindrical, and works without any other Impediment than what lies before the Teeth, yet even with this Advantage, the Operation goes on ſo gradually, that from the Experience I have had, I do not find the leaſt danger of ſuddenly paſſing through to the Brain as is apprehended, if we proceed with the Caution of not leaning too hard on the Inſtrument when the Bone is almoſt ſawed through; and with reſpect to the Impracticableneſs of inclining it on any particular part of the Circle, when ſawed uneven, which is commonly alledged, whoever will try the Experiment, will in a Moment diſcover the Falſeneſs of the Aſſertion: beſides, the very Inſtance ſtated overthrows this reaſoning, for if the Circle has been already made deeper in one part than another, it muſt imply that we have leaned with more Force on one part than another, and conſequently may at pleaſure do the ſame thing again: As to the laſt ſuppoſed Advantage, of its receiving and retaining the ſawed piece of Bone in its Cavity, the Benefit would be ſo frivolous, if it had truly the Preference of the Cylindrical one in that reſpect, that it would not be worth mentioning; but in fact, the Cylindrical Saw receives

recives the piece of Bone very readily, and often retains it in its Cavity.

C. The Handle of the foregoing Inſtrument, called the Trephine, which is much preferable to the Trepan, (an Inſtrument like a Wimble uſed by Joiners) becauſe of the great Convenience of holding it, and leaning on one ſide or other of the Saw, as we find it neceſſary: The Trepan however, though allowed to be unhandy, is the Inſtrument moſt uſed by Surgeons in other Parts of *Europe*, upon the Suppoſition of its working quicker than the Trephine.

I have repreſented the Trephine of ſuch a Shape as to make it a convenient Elevator for which purpoſe the Extremities of it are made rough.

D. A Key to take out the Pin *E*, when the Saw has made an Impreſſion deep enough to be worked without the help of it.

E. The Pin.

PLATE IX.

The EXPLANATION.

A. A convenient Forceps to take out the circular piece of Bone, when it does not ſtick to the Saw: the Contrivance by which they readily lay hold of it, is to make the

the Extremities that are to graſp it, with an Arch of the ſame Circle as the Saw is made. Upon one of the Handles there is added a little Elevator, to lift up any ſmall Splinter of Bone, but it is not of much uſe.

B. A Lenticular: the forepart of its Blade is ſharp, in order to ſcrape the lower Edge of the Orifice of the *Cranium*, in caſe any Splinters ſhould remain after the Operation, and the Button at its Extremity receives the Duſt, that it may not fall on the Brain; but there is ſeldom any Occaſion for this Inſtrument, and I have never myſelf been under the Neceſſity of uſing it.

C. A Rugine, or Raſpatory, which I have recommended for ſcraping Bones, in order to promote Granulations of Fleſh. The Handles of theſe two laſt Inſtruments are Wood, whereas every Part of the others ſhould be made of Steel.

CHAP. XXVIII.

Of the CATARACT.

THE Cataract called by the *Latines*, *Suffuſio*, is a Diſeaſe of the Cryſtalline Humour, rendering the whole Body of it opake, ſo that the Rays of Light, which in

in the natural State of its Tranſparency, were tranſmitted to the *Tunica Retina*, become now totally intercepted, and produce no Effect. This is pretty nearly the Account delivered down to us by *Hippocrates* and the ancient *Greeks*, who likewiſe knew it by the Name of *Glaucoma*. *Galen* was perhaps the firſt, who ſpecified any Difference, in defining the Cataract to be a Film ſituated behind the *Iris*; and the *Glaucoma*, a Diſorder of the Cryſtalline Humour; which Opinion, with very little Alteration, has prevailed from his Time, down to the latter End of the ſeventeenth Century, when there aroſe a Diſpute on this Diſtinction of *Galen*'s, ſome of the Moderns aſſerting with *Hippocrates*, that the Cataract is always a Diſeaſe of the Cryſtalline Humour, and indeed with ſo much Reaſon, that there is now hardly any one who doubts it: However, during theſe laſt forty Years, this Subject has produced many Arguments on both Sides.

The Mathematicians have obſerved in thoſe who have been couched, that the Defect of Sight remaining after the Operation, anſwers nearly to what in Optics, the removing the Cryſtalline Humour would occaſion, have endeavoured to prove, that the

the Operation muſt in conſequence be, the depreſſing that Humour, and leaving the Eye to perform its Function afterwards with the Aqueous and Vitreous only; which wanting the Denſity of that Humour, will not refract the Rays ſufficiently to re-unite them on the *Retina*; whence Patients after their Cure are obliged to uſe Convex Glaſſes, as Subſtitutes for the depreſſed Cryſtalline Humour.

Dr. *Petit*, a moſt accurate Anatomiſt of *Paris*, has from a critical Examination of the Figure of the Eye, argued againſt the Poſſibility of a Film's Exiſtence in the Poſterior Chamber, by reaſon of the Smallneſs of that Chamber, or Proximity of the Cryſtalline Humour to the back of the *Iris*; and again, from the Impracticability of diſlodging ſuch a Film, without offending the ſound Cryſtalline Humour.

Laſtly, and what is more certain, Anatomiſts have frequently diſſected the Eyes of Perſons under this Diſorder after their Death, and have found it to be always an Opacity of the Cryſtalline Humour, agreeably to the Definition of a *Glaucoma:* ſo that by conſequence, we muſt underſtand the Words *Cataract* and *Glaucoma*, as ſynonymous Terms,

Terms, ſince they are in fact, but one and the ſame Diſeaſe.

I think it needleſs to ſtate the Reaſons on the other Side of the Queſtion; as they are of little weight, and indeed almoſt univerſally exploded.

In deſcribing the Nature of a Cataract, it has hitherto been a poſitive Maxim laid down by Oculiſts of every Nation, that there is one certain Stage of the Diſtemper, in which only, the Operation is proper, and this State of the Diſeaſe, is ſaid to be the Maturity of the Cataract: They have compared it to the Ripeneſs of Fruits, and have ſuppoſed a regular Change in the Conſiſtence of the Cryſtalline Humour, from the Moment it is affected. They ſay, the Diſeaſe upon its firſt Invaſion, gradually liquefies the Humour, and that after its Arrival to the utmoſt Period of Liquefaction, it then begins to acquire various Degrees of Tenacity, 'till at laſt it becomes perfectly hard, or as they ſtile it horny: That the Skill of the Surgeon diſcovers itſelf, by fixing on that Time for the Operation, in which the Fluidity of the Cataract is no Obſtacle to the Depreſſion of it, from its want of Reſiſtance to the Needle; nor its Hardneſs,

neſs, from the Elaſticity of it connecting Fibres, which immediately return it to its former Poſition.

This, in a few Words, is the general Doctrine; but I think the regular Alteration of the Denſity of the Cryſtalline Humour is very much to be doubted, and for my part I cannot help poſitively excepting to the Rule here laid down; having not only ſeen Cataracts of twenty or thirty Years growth, often upon the Touch of the Needle prove ſoft and milky, but alſo many Inſtances, in which a due Degree of Conſiſtence occurred after four or five Months, I may venture to ſay Days, when the Cataract was the Conſequence of a Blow or Puncture: both which Caſes ſo little correſpond with this ſuppoſed Change, that they ſeem not only to overthrow it, but to imply that the Cataract, after it has acquired its total Degree of Opacity, may frequently, if not generally, continue in the ſame ſtate of Tenacity to the Life's end: And tho' I will not take upon me to affirm that Cataracts come always very early to their greateſt Conſiſtence, yet this we may ſafely deduce from theſe Obſervations; that whenever they become intirely opake, we may properly undertake the Operation; which

which has been my method of Practice hitherto, nor do I find any Reaſon to lay it aſide.

I ſhall however obſerve in this Place, that contrary to the received Opinion, I have upon Examination, found Cataracts of a proper Conſiſtence to be couched, long before they would have been opake; but this only confirms what I have already laid down, that there is not ſuch a regular Change in them as has been ſuggeſted, and that we may always venture on the Operation when they are quite opake; ſince it might be ſucceſsful as I have here intimated, even before that time; though I ſhould never adviſe it, nor do I believe that Patients would ſubmit to it, whilſt they enjoyed a certain degree of Sight.

Since then the *Glaucoma* is no other Diſeaſe than the Cataract, we muſt at once diſcard the Diſtinction of theſe two Diſtempers as merely imaginary; and from what has been ſaid with regard to the Conſiſtence of a Cataract, that whatever it be, the Removal of the Humour is the ſole End of the Operation, the Diſtinction of a true and falſe Cataract will appear equally frivolous; and conſequently moſt of the Subdiviſions compriſed under this laſt; ſuch as the Bag, the Milky,

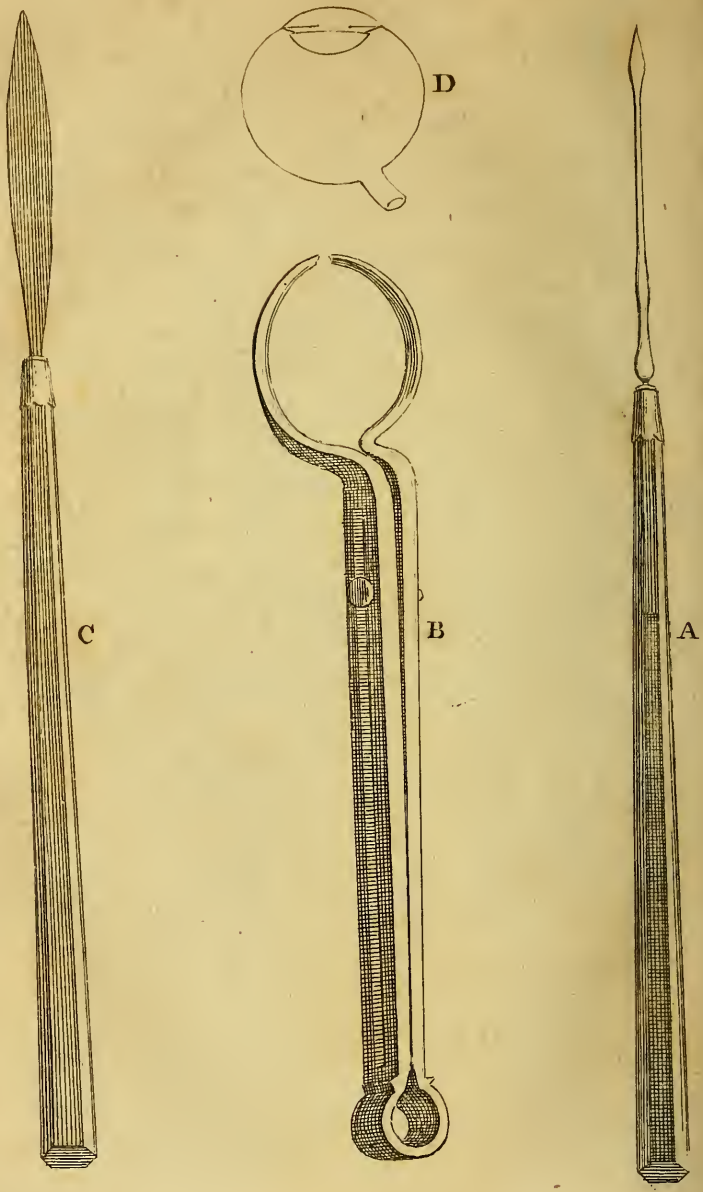
Milky, the Purulent, the Doubtful, the Membranous, the Fibrous, the Shaking, and many more, in the Books on this Diſeaſe; the greateſt part of which, are Names that puzzle the Memory, without informing the Underſtanding, and indeed, have not a ſufficient foundation in Nature, but owe their diverſity of Character more to the Imagination of Writers, than any real Variety in the Diſeaſe.

The general Criterion of the Fitneſs of Cataracts for the Operation, is taken from their Colour; the Pearl-coloured, and thoſe of the Colour of burniſhed Iron, are eſteemed proper to endure the Needle; the White are ſuppoſed milky, the Green and Yellow horny and incurable: The black Cataract is deſcribed by moſt Authors, but I dare ſay, has been miſtaken for a *Gutta Serena*, where no Diſeaſe appearing, the Pupil ſeems black as in a natural ſtate of the Eye: And as to the Green one, I have not as I remember, in a great number of Cataracts, meet with a ſingle Inſtance of it, but poſſibly it may be in Nature; and one would indeed imagine the Deſcribers of it could not be miſtaken, in what muſt have been ſo evident.

The Depreſſion of a Cataract of any Colour would be the Cure, if that alone was the Diſtemper of the Eye; but it generally happens, that the Yellow Cataracts adhere to the *Iris* ſo firmly as to become immoveable; beſides, when they follow in Conſequence of a Blow, which is often the Caſe, either the Cells of the Vitreous Humour are ſo much diſturbed and broken, or the *Retina* affected, that a degree of Blindneſs will remain, though the Cataract be depreſſed, and that one Cauſe removed.

To judge whether the Cataract adheres to the *Iris*, if you cannot at once diſtinguiſh it by your Sight, ſhut the Patient's Eye, and rub the Lids a little; then ſuddenly opening it, you will perceive the Pupil contract, if the Cryſtalline Humour does not prevent the Action by its Adheſion: And when this is the caſe in any kind of Cataract, the Operation can hardly be adviſed, though where the Adheſion has been ſlight, I have now and then performed it with Succeſs.

Another Conſideration of the greateſt moment, before undertaking the Cure, is to be aſſured of the right ſtate of the *Tunica Retina*, which is very readily learnt, where there is no Adheſion of the Cataract, from the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the Light falling between the *Iris* and Cryſtalline Humour, which if the Eye is not ſenſible of, it is a certain Indication of another Malady, and abſolutely forbids the Operation. Generally, this Cataract takes its riſe from Head-achs, Convulſions, and nervous Diſorders. How the Eye perceives in this caſe, *vide* the Copper-plate.

The Operation for the ſoft Species of Cataract, which may perhaps properly be ſtiled Milky, has been by ſome Writers falſly ſaid never to ſucceed. Of this there are two ſorts; ſome where we do not perceive any Membrane, but which are almoſt uniformly ſoft, and admitting the Needle through them as through Water, are conſequently immoveable; and others where the Humour is liquefied, and contained in its own Membrane; now pretty much thickened by the Diſeaſe, which laſt frequently does well; for upon breaking the Membrane, the Fluid burſts out and precipitates, and the Membrane itſelf, if it is not depreſſed, in proceſs of time ſhrinks into a ſmall Compaſs, or waſtes quite away.

Whether the whole Cataract after its ſubſiding continues to lie at the bottom of the Eye, or is quite waſted by being ſeparated from its Veſſels, I have never had an-

Opportunity of knowing positively by dissecting one that had been couched; but by what we see of those, which have not been totally depressed below the Pupil, and continue in that state for ever after, we may suppose that they only waste a little: I know one Instance of a Woman whose Cataract after couching, became quite loose in the Eye, and in an erect Posture sunk to the bottom, but by stooping the Head forward, she could bring it quite over the Pupil. On the other hand, I once couched a Person, when upon the first Attempt to depress the Cataract it suddenly sprung up, and made its Way thro' the Pupil into the Anterior Chamber of the Eye, where I left it without endeavouring to dislodge it again. In about six Weeks it began to diminish, and at the End of ten Weeks was entirely wasted, and the Patient saw extremely well.

When none of the Objections I have stated, forbid the Operation, it may be thus done: Having placed your Patient in a convenient Light, and in a Chair suitable to the Height of that you yourself sit in, let a Pillow or two be placed behind his Back, in such a manner, that the Body bending forward, the Head may approach near

near to you; then inclining the Head a little backward upon the Breaſt of your Aſſiſtant, and covering the other Eye ſo as to prevent its rolling, let the Aſſiſtant lift up the ſuperior Eye-lid, and yourſelf depreſs a little the inferior one: This done, ſtrike the Needle thro' the *Tunica Conjunctiva*, ſomething leſs than one tenth of an Inch from the *Cornea*, even with the Middle of the Pupil, into the poſterior Chamber, and gently endeavour to depreſs the Cataract with the flat Surface of it. If after it is diſlodged, it ariſes again, though not with much Elaſticity, it muſt again and again be puſhed down. If it is membranous; after the Diſcharge of the Fluid, the Pellicule muſt be more broke and depreſſed: If it is uniformly fluid, or exceedingly elaſtick: we muſt not continue to endanger a terrible Inflammation, by a vain attempt to ſucceed If a Cataract of the right Eye is to be couched, and the Surgeon cannot uſe his left Hand ſo dexterouſly as his right, he may place himſelf behind the Patient, and uſe his right Hand.

I have not recommended the *Speculum Oculi*, becauſe upon the Diſcharge of the Aqueous Humour through the Puncture, the Eye being ſomewhat emptied, more

readily admits the Depreſſion of the Cryſtalline Humour, than when preſſed upon by the Inſtrument.

As to the Method of treating the ſucceeding Inflammation, (when it happens, for ſometimes there is none) I can adviſe nothing particular, but to refrain from thoſe *Collyria*, that are charged with Powders; for the thinner Parts flying off, leave a gritty Subſtance in the Eye, which muſt be pernicious; Bleeding, and other gentle Evacuations are found abſolutely neceſſary. The Uſe of cool Applications externally, is moſt eaſy to the Eye; but after all, there will ſometimes enſue a troubleſome Ophthalmy, which, with the Uncertainty there always is of Succeſs after the Operation, have detered moſt Surgeons from undertaking it, and 'till lately from ſtudying the Nature of the Diſeaſe; but I fancy the Operation will come into greater Repute, when more generally practiſed by Men of good Character; for it is leſs the Difficulty, than the Abuſe of it by Pretenders, which has brought it into Diſcredit.

Since the Publication of the ſixth Edition of this Treatiſe, a Method of removing the Cataract by opening the *Cornea*, and extracting the Cryſtalline itſelf, has been diſ-

discovered. The Experience of a little more Time will evince whether it be preferable or not to the old Operation. For the Manner of performing it, and the Success attending it, I must refer the Reader for the present to the *Philosophical Transactions*, and to the third Edition of my *Critical Enquiry*, where I have said all I yet know on this Subject.

CHAP. XXIX.

Of Cutting the IRIS.

THERE are two Cases where this Operation may be of some Service; one, when the Cataract is from its Adhesion immoveable; and the other, when the Pupil of the Eye is totally closed up by a Disorder of the Muscular Fibres of the *Iris*, which gradually contracting the Orifice, at last leaves the Membrane quite imperforate. This last Distemper has hitherto been deemed incurable. The Adhesion of the Cataract I have spoken of in the preceding Chapter, and considered it as a Species of Blindness not to be relieved: But Mr. *Cheselden* has invented a Method of making an

artificial Pupil, by ſlitting the *Iris*, which may relieve in both the Inſtances here ſtated.

In doing this Operation, the Patient muſt be placed as for couching, and the Eye kept open and fixed by the *Speculum Oculi*, which is abſolutely neceſſary here, for the very Reaſon I would diſcard it in the other; ſince the Flaccidity of the Membrane from the Iſſue of the Aqueous Humour, would take away its proper Reſiſtance to the Knife, and make it, inſtead of being cut through, tear from the *Ligamentum Ciliare:* then introducing the Knife in the ſame Part of the *Conjunctiva* you wound in couching, inſinuate it with its Blade held horizontally, and the Back, of it towards you, between the *Ligamentum Ciliare* and Circumference of the *Iris*, into the anterior Chamber of the Eye, and after it is advanced to the farther Side of it, make your Inciſion quite thro' the Membrane; and if the Operation ſucceeds, it will, upon wounding, fly open, and appear a large Orifice, though not ſo wide as it becomes afterwards.

The Place to be opened in the *Iris*, will be according to the Nature of the Diſeaſe: if the Membrane itſelf be only affected with a Contraction, the middle Part of it, which

which is the natural Situation of the Pupil, muſt be cut; but if there be a Cataract, the Inciſion muſt be made above or below the Cataract, though I think it more eligible to do it above.

The contracted *Iris*, from a paralytick Diſorder, is ſo often complicated with an Affection of the *Retina*, that the Succeſs is very precarious in this Caſe. This Operation, by what I have ſeen, has anſwered beſt in Adheſions of the Cryſtalline Humour, though to ſpeak truly, but very ſeldom even there. As I would not miſlead any one who ſhall practiſe an Operation not yet much known in the World, I do confeſs that either the Danger of the *Iris* ſeparating from the *Ligamentum Ciliare*, or of the Wound not enlarging ſufficiently, do upon the whole make the Event very doubtful. I once performed it with tolerable Succeſs, and a few Months after the very Orifice I had made, contracted, and brought on Blindneſs again. Since it has been diſcovered by the Extraction of the Cryſtalline, that a large Wound may be made through the *Cornea* without any bad Conſequence, I ſhould imagine this Operation would be much improved by introducing the Knife perpendicularly thro' the

Cor-

Cornea and *Iris*, and cutting both at the ſame time, ſo that the Inciſion of the *Iris* ſhould be exactly in the ſame Part, and of the ſame Dimenſions as by the other Method.

In theſe two Chapters I have not once uſed the Word *Uvea*, but have made mention of the *Ligamentum Ciliare*, two or three times; both which Parts are but little underſtood for want of proper Explanation; but which muſt be rightly conceived of, in order to underſtand what I have ſaid upon theſe Diſeaſes.

The generality of Anatomiſts call that Membrane which I have ſpoken of under the Name of *Iris*, the *Uvea*, and its anterior *Lamina*, the *Iris*; others again, call the Membrane, *Uvea*, and the Colour of it, *Iris*; but both one and the other Diſtinction confound Learners exceedingly, and take their riſe from a want of proper Attention to the Hiſtory of Anatomy. The Ancients, who have given moſt of the Names we now employ in the Deſcription of the Eye, were verſed chiefly, if not altogether, in the Diſſection of Brutes, amongſt which, thoſe of the graminivorous kind, have a party-coloured *Choroides*, one half of it being dark, and the other of a light

light ſhining Green; this laſt, from its Reſemblance to an unripe Grape, was called the *Uvea*; but the ſucceeding Writers amongſt the Moderns, applying themſelves to human Diſſections only, and not duly conſidering the Difference of the human *Choroides*, which is nearly of an uniform Colour, and of that above deſcribed, have retained the Appellation, though we have not the Thing. Hence has ariſen the great variety of Miſapplication of this Word, which ought no more to be adopted in the Anatomy of the human Eye, than the *Tunica Nictitans*, which is proper to certain Beaſts and Birds.

The *Ligamentum Ciliare* is that circular Line on the Globe of the Eye, where the *Sclerotis*, *Choroides*, *Retina*, *Cornea*, *Proceſſus Ciliares*, and *Iris*, terminate; forming a whitiſh Ring ſomewhat denſer than any other Part of the Coats; but ſince the Inſtitution of this Term, the Deſcription of the Part it implies, has been very much neglected, and the Term itſelf confounded with the *Proceſſus Ciliares*; wherefore it was neceſſary to define it, that the Proceſs of the Operation of the *Iris* might be better comprehended.

PLATE

PLATE X

The EXPLANATION.

A. The Couching-Needle, the broad Part of which towards the Point is flat on one Side; but on the other, is a little convex, to give it more Subſtance and Strength.

The Handle of this Inſtrument is white Ivory, inlaid with a Streak of Black in that Part of it lying even with the convex Surface of the Blade: The Meaning of which is, that by holding the Handle with the Streak upwards, we may be guided to depreſs the Membrane of a milky Cataract with the flat Surface, tho' the Subſtance of the Cataract ſwimming in the Eye obſcures the Needle, and prevents its being directed in a proper Poſition by the Sight.

B. A *Speculum Oculi,* which is made to open or ſhut by an Iron Button ſliding along a Slit in the Handle. This Inſtrument it compoſed of one Piece of Steel, in ſuch a manner that it would fly open by its Elaſticity, if the two Branches of the Handle were not confined by the Button. The Circle of it ſhould be covered with Velvet, to make it lie ſofter on the Eyelids.

C. The

C. The Knife for cutting the *Iris*, the Blade of which has two edges, reſembling a Lancet, which are more advantageous than one only, in cutting the *Cornea* for the extraction of the Cataract.

D. The Figure of the Eye.

The ſmall Arch on the Forepart of the Figure is the *Cornea*: the two ſtraight Lines tending to each other are the *Iris*, and the Opening between them is the *Pupil*; the Space between the *Cornea* and the *Iris*, is the anterior Chamber of the Eye; the Spherodial Body is the *Cryſtalline Humour*; The Space between the *Iris* and Cryſtalline Humour, is the *Poſterior Chamber*; and the two ſhort Lines which ariſe from the meeting of the *Cornea*, *Iris*, *&c.* and run upon the Cryſtalline Humour, are the *Proceſſus Ciliares*. The Deſign of this Repreſentation is to ſhew the Smallneſs of the poſterior Chamber, and how ſome Light may paſs obliquely between the *Iris* and Cryſtalline Humour, thro' the Interſtices of the Ciliary Proceſſes, and occaſion that Degree of Sight which People with Cataracts have.

CHAP.

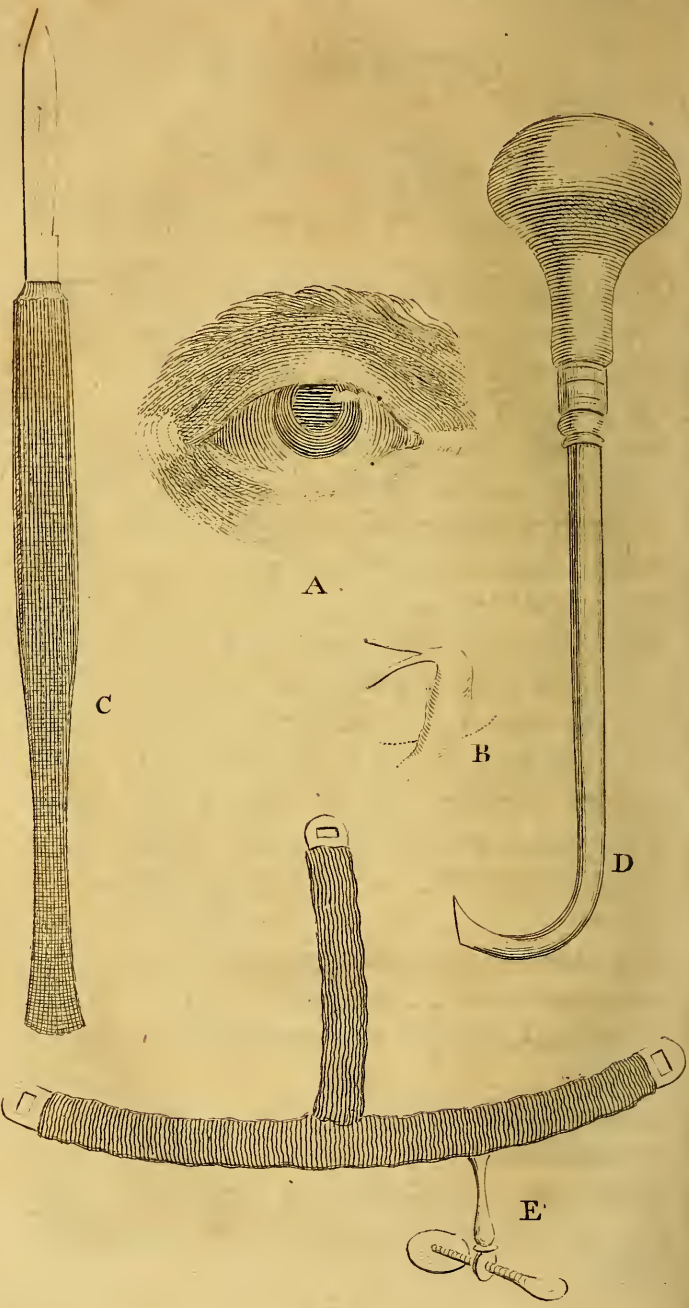
CHAP. XXX.

Of the FISTULA LACHRYMALIS.

THE *Fiſtula Lachrymalis* is generally underſtood to be ſuch a Diſorder of the Canals leading from the Eye to the Noſe, as obſtructs the natural Progreſs of the Tears, and makes them trickle down the Cheek: But this is only the firſt and mildeſt Stage of the Diſeaſe; in the next, there is a Mucus reſembling Matter, and afterwards Matter itſelf diſcharged with the Tears from the *Puncta Lachrymalia*, and ſometimes from an Orifice broken thro' the Skin between the Noſe and Angle of the Eye: The laſt and worſt Degree of it is, when the Matter of the Abſceſs, by its long Continuance, has not only corroded the neighbouring ſoft Parts, but alſo affected the ſubjacent Bone.

For the better underſtanding the Seat and Nature of this Diſtemper, I have here annexed a Repreſentation of the *Lachrymal* Ducts.

In treating of the *Fiſtula Lachrymalis*, moſt Writers mention the Inflammation and Ulceration of the *Saccus*, as being ſometimes the immediate Cauſes of it; but then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then they all ſuppoſe that the Tears becoming acrid and corroſive, excite the Inflammation and Abſceſs; though many of them imagine that the Tears themſelves not finding a way thro' the Naſal Duct, do, from ſtagnating in the *Saccus*, corrupt and become the Matter diſcharged by the *Puncta Lachrymalia*; but the latter Opinion is moſt certainly ill-grounded; for beſides that the Tears are not of a Compoſition to become *Pus*, it may be obſerved almoſt at any time upon preſſing the Abſceſs, that the two Fluids appear unmixed; and with regard to the general Doctrine of the Sharpneſs of the Tears producing the Diſorder, I think it is much to be queſtioned; ſince the *Cornea* and *Tunica Conjunctiva* being more ſenſible Membranes than the *Saccus*, would more readily be offended by them; but as we ſee they are not in the leaſt injured, and every Part of an Animal Body is ſubject to Inflammation, *&c.* from internal Cauſes, I believe this external one may be juſtly doubted.

Whatever be the Cauſe of the Inflammation, whether the Small-pox, *Lues Venera*, *&c.* the Effect of it, is an Obſtruction of the *Ductus ad Naſum*. That a total Obſtruction ſhould follow upon an Inflammation

mation in ſo large a Veſſel as the Naſal Duct, I preſume is owing to its Situation in the bony Groove of the *Os Unguis*, which not allowing it to dilate in its Inflammation and thickening, muſt neceſſarily make it fill up the whole Channel, and cauſe that Regurgitation of Tears and Matter, which is the conſtant Symptom of this Diſeaſe.

Some Years ſince, Monſieur *Annell* a *French* Surgeon, recommended in the recent Fiſtula, to paſs a ſmall Probe thro' one of the *Puncta Lachrymalia* into the *Saccus* and Noſe, in order to break the Concretions which were ſuppoſed to make the Obſtruction, and with a ſmall Pipe and Syringe to throw an Injection thro' the other, in order to waſh them away. This Method was at firſt received with great Applauſe, and ſtill continues to be practiſed by ſome very eminent Surgeons; yet by what I have been able to learn from the Experiments of others, and the reaſon of the Thing, I am by no means inclined to think favourably of the Invention; for as the very Characteriſtic of this State of the Fiſtula, is the Reflux of the Tears from the *Saccus*, the Channels leading to it from the *Puncta Lachrymalia* muſt be ſuppoſed clear; and

as

as to the Obſtruction in the Naſal Duct; an Injection thrown with ſo little Force, can hardly be imagined ſufficient to remove it; and ſtill leſs, if it be true that the Obſtruction is not owing to any looſe Subſtance clogging up the Paſſage, but to an Inflammation of the Membranes.

If then the Injection cannot aſſiſt by the Force of its Stream, the Advantage muſt ariſe from its balſamick Qualities; but no Surgeon at this time dilates an Abſceſs of any kind by Injections when the *Pus* is good-conditioned, and he can by Compreſs diminiſh the Cavity of it, as may be done in this very Caſe, and which ſhould be practiſed before any other Method is undertaken: Indeed *Annel* and his Followers, after the Injection, applied a Compreſs and Bandage, to the good Effects of which, rather than any of the other Proceſſes, I am inclined to think the Succeſs was owing.

When the Quantity of Matter returned by the *Puncta* increaſes, notwithſtanding the uſe of Compreſs, and the Tumour of the *Saccus* grows larger; it then becomes neceſſary to perform the Operation; the Deſign of which, is to cure the Ulcer, and make way for the Tears into the Noſe.

The general Notion that the Abſceſs of

the Bag always occaſions a Caries of the *Os Unguis*, perhaps may have led Surgeons into the Method of deſtroying both *Saccus* and Bone with a perforating Inſtrument, and afterwards more effectually with an actual Cautery, in order to remove the diſordered Bone, and at the ſame time to make an artificial Canal into the Noſe: But as there are many Inſtances of Cure by a mere Inciſion of the *Saccus Lachrymalis*, the rougher Method of Perforation ought not to be uſed, unleſs there is evidently a Caries in the adjacent Bone, or that after the Ulcer of the *Saccus* is healed, the Tears cannot be made to paſs through the Duct; tho' even in that caſe, the Application of Fire is not only generally uſeleſs, but often proves hurtful, and defeats the very End it was intended to promote. The Deſign of the Cautery, is to prevent the artificial Canal made by the Perforation from cloſing, but the Operators who recommend it confeſs that in Perſons who have been cauteriſed, even at the beſt, the Tears trickle down ever after; whereas that Accident does not ſo often attend on thoſe where the Inciſion only is practiſed: The Reaſon of this Difference may perhaps be more clearly explained by a parallel Inſtance: If we divide

vide a Vein quite thro', and cauteriſe its Extremities, 'tis well known that the Sloughs formed by the Fire, hardly ever ſeparate from the living Parts of the Vein, until they are totally cloſed up ſo as to prevent any Effuſion of the circulating Blood; the Conſequence of which is, the breaking off the Communication of the divided Parts of the Vein; whereas if there was only an Opening made with a ſharp Inſtrument, or even a Piece of the Vein carried away by it, the divided Parts would ſoon re-unite, and the Circulation be continued thro' them: for the ſame Reaſon, by the uſe of the Cautery, the Communication between the *Puncta Lachrymalia* and *Sacchus*, will often be intirely deſtroyed; and the Perforation into the Noſe, tho' it remain open, will of conſequence not anſwer the Purpoſe for which it was intended.

It may perhaps be ſaid, that by introducing the Cautery through a *Canula*, the upper part of the *Saccus*, or opening of the *Lachrymal* Channels, may be protected from theſe ill Effects. But I believe it will plainly appear, by the Rudeneſs of the Scar after the healing of the Wound, how powerfully Fire will work upon the neighbouring Parts, notwithſtanding this Precaution.

From what has been ſaid of the Nature of this Diſeaſe, the uſe of Fire muſt be diſcarded in all the Stages of it, and even Perforation for the moſt part be practiſed only when the ſubjacent Bone is carious; but this Circumſtance is very rare, and for my own part, ſince I have doubted its frequency, it has not been my fortune to meet with a ſingle Inſtance of it, tho' I have had Fiſtulas of many Years ſtanding under my Care, in ſome of which, the *Pus* has found iſſue thro' the Bag and Skin, and formed an external Ulcer likewiſe. The Reaſon why the inferior part the of *Saccus* is not ſo often corroded as the ſuperior (in which caſe the Bone would neceſſarily be affected) is, that here, as in every other part of the Body, Abſceſſes will break where they are leaſt under Confinement, as in thoſe Places they ſooner give way to the preternatural Influx of the Juices, and in conſequence becoming weaker, will ſooner be deſtroyed. Since therefore, neither the long continuance of the Diſeaſe, nor the great Diſcharge of Matter, are poſitive Symptoms of a Caries; we ought to be well ſatisfied of it by the Feel of the Probe before we perforate; but if upon opening the Bag, or in the courſe of the Dreſſing, it appears

appears the *Os Unguis* is bare, we are not to wait for an Exfoliation, the Bone being ſo very thin, but to break thro' with a ſmall Perforator.

Many Writers mention the Succeſs of having ſometimes treated the *Fiſtula Lachrymalis* as a mere Abſceſs of the *Saccus*, though in general they recommend the uſe of Fire; but when the Abſceſs is ſo foul as not to cure by Inciſion, a piece of the Bag itſelf muſt be cut away; and thus *Celſus* treated the *Fiſtula Lachrymalis* (tho' he alſo uſed the Cautery) without perforating.

The Manner of operating in thoſe Caſes where Perforation is not required, is this: Suppoſing the Abſceſs not broken, chooſe a time when it is moſt turgid with Matter: and to this end, you may ſhut the Patient's Eye the Day before, and lay little Slips of Plaiſter upon one another acroſs the Lids, from about the *Puncta Lachrymalia* to the internal Angle; which compreſſing their Channels, and preventing the Flux of the Matter that way, will heap it up in the Bag, and indicate more certainly the Place to be cut. If the Abſceſs is already open, the Orifice and Probe will inform you where to enlarge: Then placing the Patient in a Seat of convenient height for the

Management of your Hand; with a ſmall Inciſion-knife dilate from the upper part of the Bag, down to the Edge of the Orbit, without any regard to the Tendon of the Orbicularis Muſcle, or fear of wounding the Blood-Veſſels; tho' if you ſee the Veſſels, 'tis proper to ſhun them: The Length of this Inciſion, will be near four tenths of an Inch. It has been adviſed in opening the Bag, to introduce a ſmall Probe thro' one of the *Puncta* into its Cavity, to prevent wounding the poſterior Part of it; but I think this exceſs of care may be more troubleſome than uſeful; ſince in ſo large a Veſſel, a very ſmall ſhare of Dexterity is ſufficient to avoid the miſtake: In making this Inciſion, care muſt be had, not to cut too near the joining of the Eyelids, becauſe of the Deformity of the ſucceeding Scar: tho' the blear Eye or uneven Contraction of the Skin in that Part, after the Operation, is generally owing to the uſe of the Cautery, and not to the Wound of the Tendon of the Orbicularis Muſcle; for this laſt, is neceſſarily from its ſituation always cut through, but without any Inconvenience, becauſe of the firm Cicatrix afterwards that fixes it ſtrongly to the Bone.

When

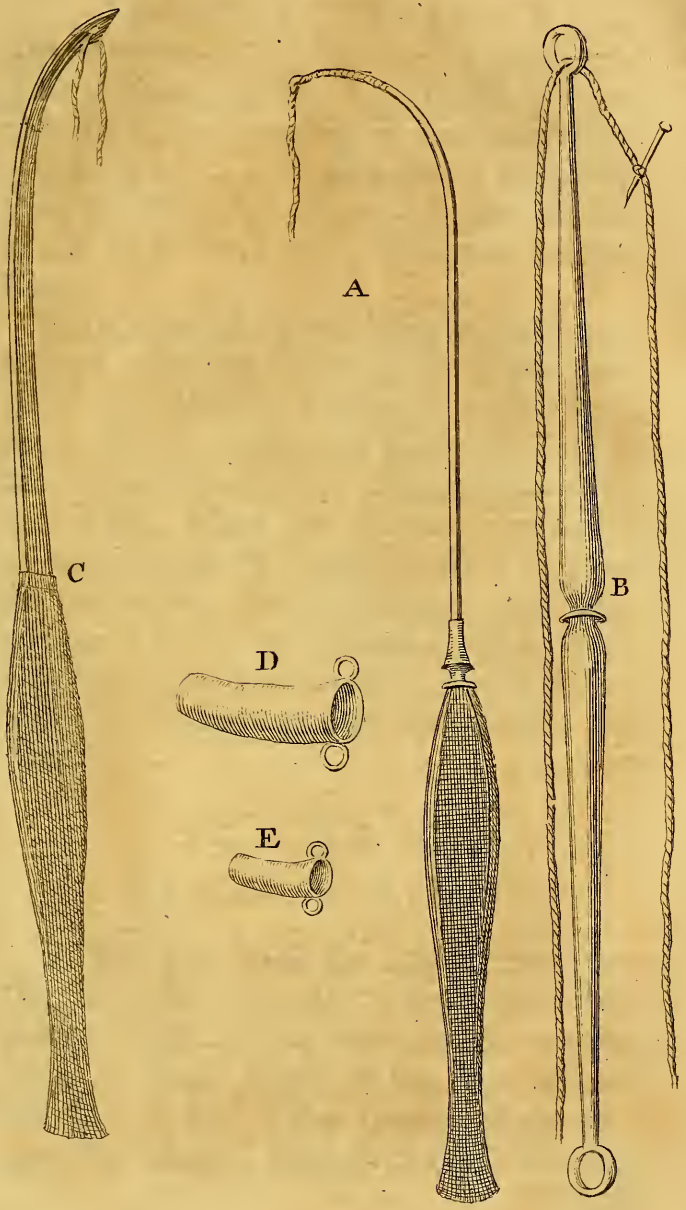
When the Bag is open, it is to be filled with dry Lint, which the next Day may be removed, and exchanged for a Doſſil dipt in a ſoft digeſtive Medicine: This muſt be repeated every Day once or twice, according to the quantity of the Diſcharge; now and then, when the Matter is not good, uſing the Precipitate Medicine, and from time to time, a Sponge-Tent, to prevent the too ſudden reunion of the upper part of the Abſceſs. When the Diſcharge begins to leſſen, it will be proper to paſs a ſmall Probe, a ſmall Bougie, or Silver Wire through the Naſal Duct into the Noſe, every time it is dreſt, in order to dilate it a little, and make way for the Tears and Matter which by their Drain will continue to keep it open. This Method muſt be followed 'till the Diſcharge is nearly over (which will be in a few Weeks) and then dreſſing ſuperficially with dry Lint, or any drying Application, the Wound will ſeldom fail of healing. After the Cure, in order to prevent a Relapſe, it will be proper, for a few Weeks, to wear the compreſſing Inſtrument repreſented in the Copper-plate.

When the Bone is bare, and the Fiſtula requires Perforation, the Perforator is not to be carried down the *Ductus ad Naſum*,

ſor fear of boring into the *Sinus Maxillaris*; but more internally towards the Noſe, which will bleed freely, if properly wounded: The Wound afterwards ſhould be dreſſed with Doſſils, in the manner above deſcribed, and the Probe or Silver Wire be every Day paſſed through the *Ductus ad Naſum*, leſt after the Cure of the Abſceſs, it ſhould ſtill remain obſtructed; and if upon trial, the Duct ſhould be ſo filled up as not to admit the Wire, it will be right to keep open the Perforation into the Noſe, with a ſmall Tent, 'till the Diſcharge is almoſt quite ceaſed.

I ſhall finiſh this Chapter with obſerving, that though a weeping Eye will ſometimes remain after the Treatment of the *Fiſtula Lachrymalis*, yet the Inconvenience of it is ſo ſmall, compared with a Diſcharge of Matter, that it would be happy if this were the worſt Conſequence of the Operation; but it ſometimes happens, that the Ulcer when healed, breaks out again, and ſometimes too, that it cannot be quite healed, by reaſon of the inferior part of the *Saccus* and Naſal Duct lying ſo deep below the edge of the Orbit, which makes the proper application of Dreſſings to the bottom of the Ulcer more difficult:

'Tis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'Tis this ſituation of the *Saccus*, that in a great meaſure prevents any good effects from burning and perforating, if the Perforation only be dreſſed, as is very much practiſed, ſince the Dreſſing will be full four tenths of an Inch above the loweſt part of the Ulcer.

With regard to the trickling of the Tears, though generally ſpeaking, it is prevented by the Method I have recommended; yet it does not appear at all wonderful, it ſhould ſo frequently be the conſequence of the others, when we conſider how much at beſt the *Saccus* contracts after a great deal of it has been deſtroyed; and how poſſible it is for the Wound to fill up with Granulations of Fleſh, which cannot fail to prove an Obſtacle to their Paſſage into the Noſe.

PLATE XI.

The EXPLANATION.

A. The Eye, with the Skin of the Eyelids, denuded, in order to ſhew the Orbicularis Muſcle: The white ſtreak running from the inner Angle of the Eye toward the Noſe is called the Tendon of the Orbicularis Muſcle, though I think it rather a ſmall

a ſmall Ligament. At a little diſtance from the internal Angle, on the edge of the Eyelids may be obſerved two black Spots, which are the Orifices of the Lachrymal channels, and called the *Puncta Lachrymalia*.

B. The exact Dimenſion of the Lachrymal Channels and Bag; the pricked Line repreſents the edge of the Orbit. I have here taken care to ſhew the Oblique Direction of the Bag as it runs from the Noſe towards the Orbit.

From comparing this Figure, with the Situation of the *Puncta Lachrymalia* in the foregoing one, it will appear that only the upper part of the Bag lies under the Tendon of the Orbicuralis Muſcle, and conſequently is the only part wounded, and burnt through in the common Operation, when the Perforator is carried horizontally from the Angle into the Noſe, as is generally practiſed. And I believe the ſize of the Bag here repreſented, though not ſo large as when it is diſeaſed, will at once ſhew the Propriety of opening it firſt by an Inciſion down to the Orbit, or even farther, and then treating the Fiſtula with the ſame Dreſſings as we do other fiſtulous Ulcers.

C. A ſmall Inciſion-knife, more handy than a larger for opening the Bag.

D. The Perforator to deſtroy the *Os Unguis*, if ever it ſhould happen to be neceſſary.

E. An iron Inſtrument made thin and pliable, to ſet even on the Forehead, and for uſe covered with Velvet; the Holes at the three Extremities receive two pieces of Ribband, by which it is faſtened on the Forehead: The Button at the end of the Screw is to be placed on the *Saccus Lachrymalis*, and the Screw to be twiſted 'till the Button makes a conſiderable Preſſure on the Bag: The Button ſhould be covered with Velvet, and a little Compreſs of Plaiſter be laid on the Bag before it is applied, to prevent the Skin from being galled by the Preſſure. The little branch of Iron which receives the Screw, muſt be ſoft enough to admit of bending, otherwiſe it will be difficult to place the Button exactly on the Bag. This Inſtrument is for the left Eye only; it ſhould be worn Night and Day in the beginning of a Fiſtula, and after a Fiſtula has been healed by Inciſion: but as the Succeſs depends upon the exact Situation of the Button upon the Bag, it ſhould be carefully looked after.

CHAP.

CHAP. XXXI.

Of the BRONCHOTOMY.

THE Operation of *Bronchotomy* is an Inciſion made in the *Aſpera Arteria*, to make way for the Air into the Lungs, when Reſpiration is obſtructed by any Tumour compreſſing the *Larynx*, or ſome other Diſorder of the *Glottis* and *Aſpera Artera*, without any apparent Tumour. Theſe are the Caſes in which it is ſuppoſed to be uſeful; but I am inclined to think it hardly ever can be of ſervice, but where the Complaint is attended with ſome Swelling, ſince I cannot find any Inſtance to my ſatisfaction of good done by this Operation in the other Species of *Angina*; nor has it appeared upon Examination of ſeveral who have died of it, that the Air was obſtructed by any Stricture of the *Glottis*, or *Aſpera Arteria:* If then the Paſſage remains open, and Reſpiration be diſturbed from other Cauſes, the making a new Orifice can be but of little advantage: I once performed it under this circumſtance, but it gave no ſort of Relief.

Upon

Upon the whole then, I imagine the practice of this Operation uſeful only in that Species of *Angina*, where the Throat is exceedingly enlarged by the Swelling of the Thyroid Gland, and Parts adjacent, called *Bronchocele*, which by their weight may preſs upon the *Trachea*, ſo as to make it in ſome degree narrower, and prevent the free courſe of the Air to and from the Lungs. But ſhould any one judge it proper in the Inſtance I object to, the Operation is ſo eaſy to perform, and ſo utterly void of any Danger whatſoever, notwithſtanding the frightful Cautions laid down by Writers, that I would not altogether diſcourage the Trial, 'till I have farther Proof of its Inſignificance.

The manner of doing it, is by making a longitudinal Inciſion through the Skin, three quarters of an Inch long, oppoſite to the third and fourth Ring of the *Trachea*, if you have the choice of the Place; and when you cannot make it ſo high, the Rule will be to wound a little below the Tumour: It is always adviſed to pinch up the Skin for this Proceſs, which however may be left to the Diſcretion of the Surgeon. When the Skin is cut through, you muſt make a ſmall tranſverſe Inciſion into the Wind pipe, and imme-

immediately introduce a Silver crooked *Canula* near half an Inch long, with a couple of little Rings at the top of it, through which a Ribband may be paſſed round the Neck, to keep it fixed in the Wound.

Some have preſcribed making an Inciſion through the Skin and *Trachea* at once, with a Lancet or Knife, as the more eaſy and expeditious Method; and I once ſaw it performed in that manner, but it proved very inconvenient: for the Windpipe in Reſpiration moving up and down, ſlipped from the Orifice of the Skin, and made it very difficult to introduce the *Canula*, and afterwards to maintain it in its Situation: Wherefore I think it abſolutely neceſſary, to make the external inciſion longitudinal, and even pretty large, as I have directed above.

The Caution laid down of raiſing the *Sternohyoidei* and *Sternothyroidei* Muſcles, before cutting the Windpipe, it not to be regarded; and as to the Diviſion of the recurrent Nerves and great Blood-Veſſels, ſo much apprehended in this Operation, 'tis not in the leaſt to be feared; ſince they are quite out of the reach of the Inſtrument, as any one ſkilled in the Anatomy of thoſe Parts muſt very well know.

The Method of Dreſſing will be eaſily underſtood, ſince after the Patient can breathe by the natural Paſſage, if you withdraw the hollow Tent, the Wound will become a a ſimple one, and nowithſtanding its Penetration through a Cartilage into a large Cavity, require a ſuperficial Application only.

CHAP. XXXII.

Of the Extirpation of the TONSILS.

THESE Glands ſometimes grow ſo large and ſcirrhous as to become incurable, and even to threaten Suffocation if not extirpated: The manner of doing this Operation formerly, was by cutting them off; but the almoſt conſtant conſequence of this Wound, was a violent Bleeding, and ſometimes too a mortal one; on which account it is rejected in favour of the Ligature, which is not only void of Danger, but alſo ſeldom fails of cure.

If the Baſis of the Tonſil is ſmaller than the upper part, you may paſs the Ligature by tying it to the end of a Probe, bent into the form of an Arch and ſet into a handle, which being carried beyond the Gland, and round it, is to be brought back again; this done,

done, you may eſialy tie it by the means of an Inſtrument of Mr. *Cheſelden*'s Contrivance, which holds one end of the String on the ſide of the Tonſil next the Throat, while you make the Knot by pulling the other with the right Hand quite out of the Mouth, as will be eaſily underſtood by the Draught in the Copper-plate. Should it happen that the Tonſils are Conical, ſo that the Ligature will neceſſarily ſlip over its Extremity when we attempt to tie, in this caſe, he has recommended an Inſtrument like a crooked Needle, ſet in a Handle, with an Eye near the Point threaded with a Ligature, which is to be thurſt through the bottom of the Gland, and being laid hold of with a Hook, the Inſtrument is to be withdrawn ; then pulling the double Ligature forwards, it muſt be divided, and one part be tied above, and the other below the Tumour : The Knots are to be always double, and the Ligature to be cut off pretty near them : However, to confeſs the Truth, I have never in one Inſtance been obliged to uſe this Method ; for where the Tonſils have been Conical, I have employed a very thin Thread, which has cut into the Subſtance of the Gland a little, and making a ſmall Grove, prevented

vented its ſliding over. If after four or five Days they ſlip, or ſeem to have mortified the Tonſil only in part, you muſt repeat the whole Operation; and if it fail a ſecond time, you muſt even repeat it again, as I have ſometimes done, though it frequently happens, that the Cure is effected by the firſt Operation.

This kind of Extirpation is more practiſed in large Piles, that are eſteemed incurable; and if the Succeſs of it were better known, the Operation would be much more frequent. I have by this Method cured ſeveral People that have diſcharged Blood every Stool for many Years, and ſome that have been almoſt quite deſtroyed by the repeated Loſſes of it. When the Piles are withinſide of the Inteſtine, you muſt place your Patient over a Fomentation in a Cloſeſtool, and have a crooked Needle with a double Ligature ready to paſs thro' them, when by ſtraining they are puſhed out of the *Anus* (for ſometimes the Inteſtine will return ſuddenly) and tie above and below as in the Inſtance of the Tonſil. Sometimes the Piles are of that ſhape as to admit a ſingle Ligature to be tied round them without the help of a Needle, which is leſs painful: If there are ſeveral, you

muſt only tie one or two at a time; for the Pain of the Ligature is exceſſive, and would be intolerable if many were tied at once: However, every five or ſix Days, the Operation may be repeated 'till all are extirpated, and the Parts muſt be kept ſupple by ſome emollient Ointments.

When the Piles are ſmall, they may ſafely and with much leſs Pain be cut off; but when this Method has been taken with very large ones, I have ſeen the Patient in the utmoſt Danger, from a violent Effuſion of Blood.

The *Uvula* is ſubject to ſo great a degree of Relaxation ſometimes, that it almoſt choaks the Patient; the readieſt Cure is cutting off all but half an Inch of it, which may be done at one ſnip with a pair of Sciſſars (particularly curved for that purpoſe,) laying hold of it with a Forceps, leſt it ſhould ſlip away. I once cut off a *Uvula* that lay rolled upon the Tongue about two Inches; the Patient recovered immediately, and never felt any Inconvenience afterwards.

PLATE

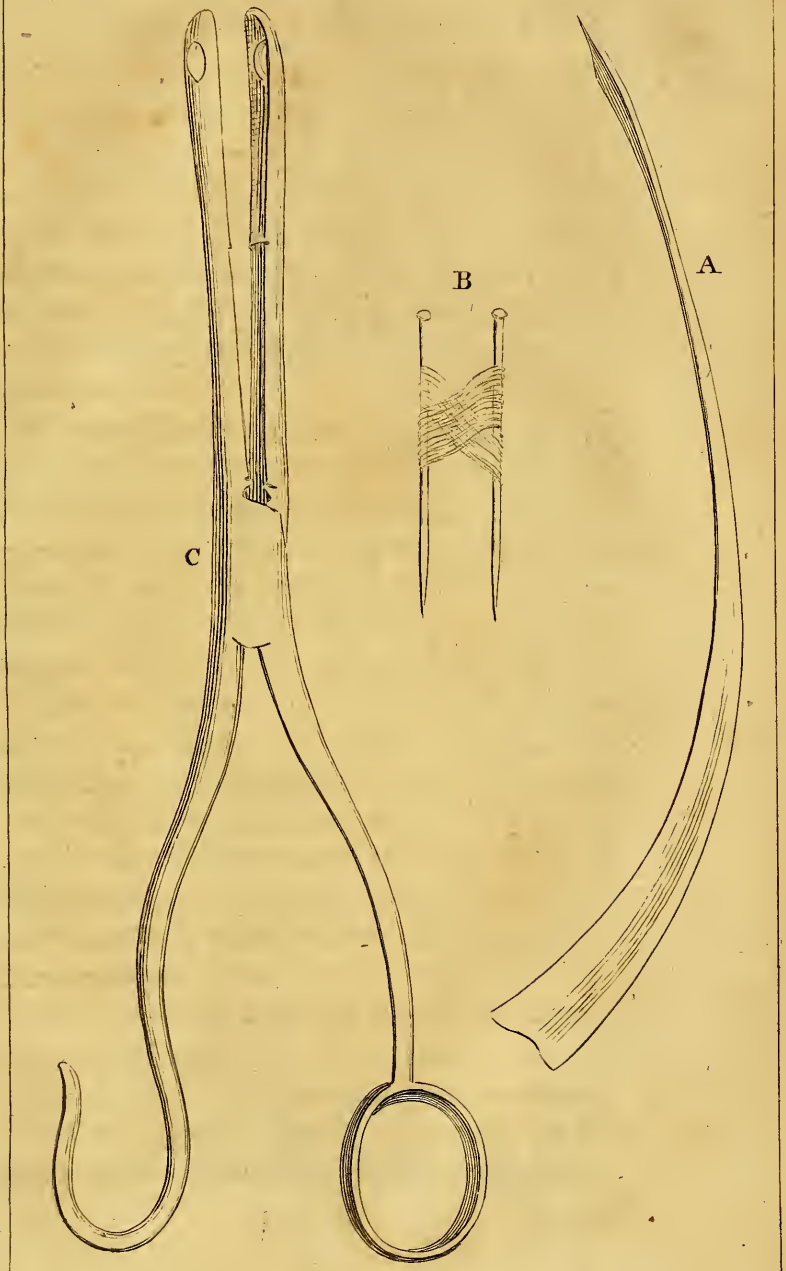
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PLATE XII.

The EXPLANATION.

A. The bent Probe fixed in a Handle, with the Ligature made of the ſame Thread as the Ligatures for tying the Blood-Veſſels.

B. The Iron Inſtrument for tying the Tonſils.

I have here made a Knot upon a Pin, which is to be ſuppoſed in the Situation of one of the Tonſils, and may eaſily be imagined to have been tied by puſhing the String beyond it, when held firm by one Hand againſt the Inſtrument, and pulled by the other, on the outſide of the Mouth.

This Inſtrument is alſo of great Service in extirpating by Ligature, a Species of Scirrhus that ſometimes grows from the Neck or Cavity of the *Uterus*.

C. The Needle with the Eye towards the Point, for paſſing the Ligature through the Tonſil, when the Baſis is larger than the Extremity.

D. A *Canula* made of Silver to be uſed in the *Empyema*.

E. A *Canula* to be uſed in *Bronchotomy*.

To keep the *Canulas* in their place, ſmall Ribbands may be paſſed through the

Rings of them, and carried round the Body and Neck; or they may be held by a Ligature run through, and faſtened to a Hole cut in a piece of ſticking Paiſter, which is to be laid on each ſide of them.

CHAP. XXXIII.

Of the POLYPUS.

THE *Polypus* of the Noſe, is ſaid to be an Excreſence of Fleſh, ſpreading its Branches amongſt the *Laminæ* of the *Os Ethmoides*, and through the whole Cavity of one or both Noſtrils. It happens very often to both ſides of the Noſe at once, and in that caſe is very troubleſome, almoſt ſuffocating the Patient, at leaſt making Reſpiration very difficult. The Intent of the Operation is the Removal of this Obſtacle; but as it is attended with different Events from the variety of Nature in the ſeveral ſorts of *Polypus's*, I ſhall endeavour to diſtinguiſh their Species, ſo as to lead us into ſome Judgment of the greater or leſs Probability of Succeſs.

They all ariſe from the Membrane ſpread upon the *Laminæ Spongioſæ*, pretty nearly in the ſame manner as the *Hydatids* of the *Ab-*

Abdomen, in one kind of Dropſy, do from the Surface of the Liver; or as Ganglions from the Tendons, borrowing their Coats from a Production of its Fibres and Veſſels: If they appear ſoft, and of the Colour of the *Serum* of the Blood, in all likelihood they are formed of ſuch a ſort of Water contained in Cyſts, which upon breaking the Membrane, leaves ſo little hold for the Inſtrument, that but a ſmall part of it can be extracted afterwards. This *Polypus* is to be left to harden, before the Operation be undertaken, which in proceſs of Time it generally will do. In the next degree of Conſiſtence, they retain pretty nearly the ſame Colour, and are often partly watry, and partly of a viſcid Texture, which tho' not tenacious enough to admit of drawing them out by the Roots, may at ſeveral Attempts be taken away by bits. The next Degree of Conſiſtence, is that which is neither ſo ſoft as to be ſqueezed to Pieces, nor ſo hard and brittle as to crumble, or adhere to the Membrane with that Force as not to admit of Separation: This is the moſt favourable one. The laſt, is hard and ſcirrhous, adhering ſo tight as to tear rather than ſeparate in the Extraction, and ſome-

times even tends to degenerate into a Cancer: This *Polypus* is very difficult of Cure.

The *Polypus* ſometimes dilates to that degree, as not only to extend beyond the *Os Palati*, and hang over the *Oeſophagus* and *Trachea*; but alſo ſpreading into the *Sinus Maxillaris*, ſo exactly fills up every Interſtice of the Noſe, as to obſtruct the lower Orifice of the *Ductus ad Naſum*, and prevent the Deſcent of the Tears, which neceſſarily muſt return through the *Puncta Lachrymalia:* and ſometimes they grow ſo enormouſly large, as even to alter the Shape of the Bones of the Face.

When the *Polypus* appears in the Throat, it is always adviſeable to extract it that Way; it being found by Experience, more ready to looſen when pulled in that Direction, than by the Noſe. To this end, it would be right, before undertaking the Operation, to let your Patient lie ſupine two or three Hours, which will bring it ſtill farther down; for the Body of the *Polypus* does not univerſally adhere, and will by its Weight ſtretch out the Fibres, by which it is connected to the Noſe; nay, there are Inſtances, where by a little Effort, ſuch as Hawking, they have dropt quite off.

The

The Method of extracting it, is by a Pair of Forceps, with a Slit at their Extremities for the better Hold, which muſt be introduced into the Noſtril about an Inch and a half, to make more ſure of it towards the Roots; then twiſting them a little from one Side to the other, you muſt continue in that Action, while you pull very gradually the Body of the *Polypus*. If it break, you muſt repeat the Extraction as long as any remains, unleſs it is attended with a violent Hæmorrhage, which is an Accident that ſometimes follows upon the Operation, and ſeldom fails when the Excreſcence is ſcirrhous: However, the Surgeon is not to be alarmed at the Appearance of an immoderate Effuſion the Moment after the Separation, for generally ſpeaking, the Veſſels collapſe very ſoon again; but if they do not, dry Lint, or Lint dipt in ſome Styptick, will readily ſtop it.

After the Extirpation, it has been uſual in order to prevent a Relapſe, to dreſs with Eſcharotick Powders, and even to burn with the actual Cautery: but neither the one or the other can be of great Service in this Caſe, and both are painful and dangerous. If ever the Uſe of corroſive Medicines is adviſeable, it ſhould be for deſtroying

the remainder of a *Polypus*, which cannot all be taken away; and then the Eſcharoticks may, in my Opinion, be better conveyed to the Part by a long Tent, than a Seton paſſed thro' the Noſe and Mouth, which is difficult to do without hurting the Patient, and very naſty to bear, tho' this is the Method at preſent practiſed, and recommended by ſome eminent Surgeons.

CHAP. XXXIV.

Of the HARE LIP.

THIS Diſeaſe is a Fiſſure in the Upper Lip, with want of Subſtance, and is a natural Defect, the Patient being always born with it, at leaſt that Species of Hare Lip which requires the Operation I am going to deſcribe. The Cure is to be performed by the twiſted Suture, the Explanation of which, I have reſerved for this Chapter. There are many Lips, where the Loſs of Subſtance is ſo great, that the Edges of the Fiſſure cannot be brought together, or at beſt where they can but juſt touch, in which caſe it need not be adviſed to forbear the Attempt: It is likewiſe forbidden in Infants, and with Reaſon, if they ſuck, but otherwiſe it may be undertaken with

with great Safety, and even with more probability of Succeſs, than in others that are older, as I have myſelf experienced.

It is not uncommon for the Roof of the Mouth to be fiſſured likewiſe; but this is no Objection to the Operation, if the Skin of the Lip is looſe enough to admit of Reunion: and it may be remarked, that the Fiſſure of the Palate, in length of Years, cloſes ſurpriſingly in ſome Caſes.

The Manner of doing it is this. You firſt with a Knife ſeparate the Lip from the Upper Jaw, by dividing the *Frænulum* between it and the Gums; and if the *Dentes Inciſorii* project, as is uſual in Infants, they muſt be cut out with the ſame Knife; then with a thin pair of ſtraight Sciſſars take off the callous Edges of the Fiſſure the whole Length of it, obſerving the Rule of making the new Wound in ſtraight Lines, becauſe the Sides of it can never be made to correſpond without this Caution.

For inſtance, if the Hare Lip had this Shape, the Inciſion of the Edges muſt be continued in ſtraight Lines 'till they meet in the manner here repreſented. The two Lips of the Wound being brought exactly together, you paſs a couple of Pins, one pretty near

the

the Top, and the other as near the Bottom, thro' the Middle of both Edges of it, and ſecure them in that Situation by twiſting a Piece of waxed Thread croſs and round the Pins ſeven or eight times; you muſt then cut off the Points, and lay a ſmall Bolſter of Plaiſter underneath them to prevent their ſcratching: But when the lower Part only of the Hare Lip can be brought into Contact, it will not be proper to uſe more than one Pin.

The Pins I employ are made three fourths of their lengths of Silver, and the other Part towards the Point, of Steel; the Silver Pin is not quite ſo offenſive to a Wound as a Braſs or Steel one; but a Steel Point is neceſſary for their eaſier Penetration, which indeed makes them paſs ſo readily, that there is no need of any Inſtrument to aſſiſt in puſhing them thro'. The Practice of bolſtering the Cheeks forward does little or no Service to the Wound, and is very uneaſy to the Patient; wherefore I would not adviſe the Uſe of it. The Manner of dreſſing will be to remove the Applications which are quite ſuperficial, as often only as is neceſſary for Cleanlineſs. The Method I would recommend, is to deſiſt the three firſt Days, and afterwards

to do it every Day, or every other Day: I do not think it at all requiſite to dreſs between the Jaw and Lip where the *Frænulum* was wounded, there being no Danger that an inconvenient Adheſion ſhould enſue. In about eight or nine Days, the Parts are uſually united, and in Children much ſooner, when you muſt gently cut the Threads, and draw out the Pins, applying upon the Orifices a Piece of Plaiſter and dry Lint. It will be proper, in order to withdraw the Pins more eaſily, to dab the Ligatures and Pins with warm Water, and alſo moiſten them with ſweet Oil, two or three Days before you remove them, which will waſh off the coagulated Blood, that would otherwiſe faſten them ſo hard to the Ligature as to make the Extraction painful.

The twiſted Suture is of great Service in Fiſtulas of the *Urethra* remaining after the Operation for the Stone, in which caſe the callous Edges may be cut off, and the Lips of the Wound be held together by this Method.

CHAP.

CHAP. XXXV.

Of the WRY NECK.

THE Operation of cutting the Wry Neck is very uncommon, and is never to be practiſed but when the Diſorder is owing to a Contraction of the *Maſtoideus* Muſcle only; as it can anſwer no Purpoſe to ſet that Muſcle free, by dividing it, (which is all that is to be done,) if the others in the Neck are in the ſame State, and more eſpecially, if it has been of long ſtanding from Infancy; becauſe the Growth of the *Vertebræ* will have been determined in that Direction, and make it impoſſible to ſet the Head upright.

When the Caſe is fair, the Operation is this. Having laid your Patient on a Table, make a tranſverſe Inciſion through the Skin and Fat, ſomething broader than the Muſcle, and not above half an Inch from the *Clavicle*; then paſſing the probed Razor with Care underneath the Muſcle, draw it out and cut the Muſcle. The great Veſſels of the Neck lie underneath; but I think, when we are aware of their Situation, the Danger of wounding them may be avoided. After the Inciſion is made, the Wound is

to

to be crammed with dry Lint, and always dreſſed ſo as to prevent the Extremities of the Muſcle from re-uniting; to which end, they are to be ſeparated from each other as much as poſſible by the Aſſiſtance of a ſupporting Bandage for the Head, during the whole Time of the Cure, which will generally be about a Month.

PLATE XIII.

The EXPLANATION.

A. The Inſtrument called the Probe-Razor to cut the *Maſtoideus* Muſcle in the Wry Neck, and is ſharp only about half its length, at that End where the Blade is broad.

B. The two Pins with the twiſted Suture, uſed in the Hare Lip.

C. The *Polypus* Forceps, with one of the Rings open for the Reception of the Thumb, which would be cramped in pulling the Forceps with much Force, if it were received in the ſame ſort of Ring as in the other Handle. 'Tis for this Reaſon I have repreſented the Stone Forceps with open Rings.

CHAP.

CHAP. XXXVI.

Of the ANEURISM.

THIS is a Diſeaſe of the Arteries, in which, either by a preternatural Weakneſs of any part of them, they become exceſſively dilated; or by a Wound through their Coats, the Blood is extravaſated amongſt the adjacent Cavities. The firſt Species of *Aneuriſm* is incident to every part of the Body, but does not often happen, except to the Curvature of the *Aorta*, which is ſubject to this Diſorder from the extraordinary Impulſe of the Blood on that Part: from the Curvature, it runs upwards along the Carotids or Subclavians, generally increaſing, 'till by its great Diſtenſion it is ruptured, and the Patient dies.

There have been great Diſputes amongſt Writers, concerning the Nature of this Dilatation of the Artery; ſome even denying the Fact, and ſuppoſing it always a Rupture; ſome, that all the Coats are diſtended; others, only the external one; and again others, whoſe Doctrine has been the beſt received, that the internal Coat was ruptured, and the external dilated: Theſe laſt have ſupported their Hypotheſis with

Argu-

Arguments drawn from the Anatomy of the internal Coat, which is ligamentous and incapable of much Diſtenſion; ſo that if an Artery be inflated with a ſufficient force, the Air will burſt that Coat, and expand the external one, that is, make an artificial *Aneuriſm*, in the ſame manner as Blood is ſuppoſed to make a natural one: But this Argument is of little force, when we conſider, that there are many parts of an animal Body, which Violence cannot ſtretch conſiderably, but which, by the gradual Influx of the Juices, become ſuſceptible of monſtrous Diſtenſion, as is the Caſe of the *Uterus*, and upon Obſervation, is evidently the Caſe likewiſe, of all the Coats of the Artery, as I have had an Opportunity to examine in ſeveral *Aneuriſms* in the Collection of the late Dr. *Douglas*, which he was ſo kind to lend me for that purpoſe.

There are ſeveral Hiſtories given of *Aneuriſms* of the Curvature of the *Aorta*, in ſome of which, the Veſſel has been ſo exceſſively dilated, as to poſſeſs a great ſpace of the upper Part of the *Thorax*; and the moſt curious Circumſtance to be gathered from them is, that the Spot of the Veſſel which is weakeſt, and where the Diſeaſe begins, generally gives way in ſuch a manner

ner to the force of the Blood continually puſhing it outwards, as to form a large Pouch or Cyſt, with Coats nearly as thick as thoſe of the Artery itſelf: However, the Thickneſs of the Coats of theſe Cyſts will laſt but to a certain Period; for when the Veſſels of the Coats can no longer conform to the Extenſion, the Circulation grows languid, the Cyſt becomes thinner at its Apex, and ſoon after burſts.

From this Deſcription of the Cyſt, it will be underſtood to reſemble the Bladder, having a large Cavity, and a narrow Neck or Opening.

The Symptoms of this *Aneuriſm*, are a ſtrong Pulſation againſt the *Sternum* and Ribs, every *Syſtole* of the Heart; and when it extends above the *Sternum*, a Tumour with Pulſation: Upon Diſſection, the Ribs, *Sternum* and *Clavicle*, are ſometimes found carious, from the Obſtruction of the Veſſels of the *Perioſteum*, which are preſſed by the Tumour. What are the Cauſes of a particular Weakneſs in any of the Coats of the Artery, I cannot take upon me to determine: but 'tis worth obſerving, that the dilated *Aorta* every where in the neighbourhood of the Cyſt, is generally oſſified; and indeed Oſſifications, or Indurations of the

the Artery, appear ſo conſtantly in the beginnings of *Aneuriſms* of the *Aorta*, that 'tis not eaſy to judge, whether they are the Cauſe or the Effect of them.

What I have ſpoken of hitherto, has been only the *Aneuriſm* of the *Thorax* from an internal Diſorder; *Aneuriſms* of the Extremities, are for the moſt part owing to Wounds, though when they happen of themſelves, they differ very little from the Deſcription I have given of that in the *Thorax:* The farther Symptoms of them are (beſides Pulſation) the Tumour's being without Diſcolouration in the Skin; its ſubſiding when preſſed by the Hand, and immediately returning when the Hand is taken away; though if it be upon the point of burſting, the Skin will grow inflamed, and the coagulated Blood in the Cyſt will ſometimes make the Pulſation much leſs perceptible.

This Species of *Aneuriſm* may ſometimes be ſupported a great number of Years, if we reſiſt its Dilation by proper Bandage; but if we do not, there is danger of its burſting; and if it be pretty large, of rotting the adjacent Bones.

A ſound Artery wounded through part of its external Coat, would in all probabi-

lity produce nearly the ſame Appearances as where the whole Coat is weakened from an internal Indiſpoſition; and this moſt likely is the caſe after bleeding in the Arm, when it has not been immediately perceived that the Artery was pricked, and the Tumour has begun to form ſome Days after the Puncture; though the common Appearance of an *Aneuriſm* from the Wound of a Lancet, is a Diſcharge of Blood firſt through the Orifice of the Skin, and, upon being ſtopt from bleeding outwardly, an Inſinuation of it among all the Muſcles as far as it can ſpread, in the Shoulder and Arm: here, the Arm grows livid from the *Ecchymoſis*, and the Blood coagulating to the conſiſtence of Fleſh, prevents any ſenſible Pulſation. The Cyſt which ariſes near the Orifice of the Artery is formed by the Cellular Capſula enveloping the Veſſels of that Part, and a portion of the *Aponeuroſis* of the Biceps Muſcle, which admitting of ſome extravaſated Blood underneath it, become exceſſively thickened and expanded: Theſe Membranes muſt make the Cyſt, otherwiſe we could not upon opening the Tumour in the Operation, diſcover ſo readily the Puncture; or if the Coats of the Artery made it, we could not ſeparate it diſtinctly

diſtinctly from the Veſſel, which would be always dilated above and below the Cyſt, as we ſee in other *Aneuriſms*.

There are ſome few Inſtances of ſmall *Aneuriſms* and Punctures of the Artery from Bleeding, doing well by Bandage; but they almoſt all require the Operation at laſt, which is to be performed nearly in the ſame manner in every part; and ſuppoſing it in the Bend of the Arm, is to be done after the following Method.

Having applied the Tourniquet near the Shoulder, and laid the Arm in a convenient Situation, make an Inciſion on the Inſide of the *Biceps* Muſcle, above and below the Elbow a conſiderable length, which being in the courſe of the Artery, will diſcover it as ſoon as you have taken away the coagulated Blood, which muſt be all removed with the Fingers, the Wound being dilated ſufficiently for that purpoſe: If the Orifice does not readily appear, let the Tourniquet be looſened, and the Effuſion of Blood will direct you to it: then carefully carrying a crooked Needle with a Ligature under it, tie the Veſſel juſt above the Orifice, and paſſing the Needle again, make a ſecond Ligature below it, to prevent the Return of the Blood, and leave the

intermediate piece of the Veſſel to ſlough away without dividing it. To avoid wounding or tying the Nerve in making the Ligature, the Artery may be cleared away from it firſt, and held up with a Hook; but ſhould the Nerve be tied with the Artery, no great Inconvenience would enſue from it. After the Operation, the Arm muſt be laid eaſy, on a Pillow in Bed, and the Wound be treated in the common Method, keeping it in that Poſture a Fortnight or three Weeks, eſpecially if it ſhould ſwell much, and not digeſt kindly.

In doing this Operation, it will be proper to have the amputating Inſtruments ready, leſt it ſhould be impracticable to tie the Artery (though I have never met with ſuch an Inſtance;) and even after having tied it, the Arm muſt be carefully watched; that in caſe of a Mortification it may be taken off; which though from Experience we learn is very ſeldom the Conſequence, ſhould to all appearance be the perpetual one; for theſe *Aneuriſms*, following always upon bleeding the *Baſilic* Vein, muſt neceſſarily be *Aneuriſms* of the *Humeral* Artery, near an Inch above its Diviſion, which being obſtructed by the Ligature, one would think, ſhould neceſſarily bring on a Morti-

Mortification; but we ſee the contrary, though for ſome time after the Operation, we can hardly diſtinguiſh the leaſt degree of Pulſe, and ever after, it continues languid. If the *Humeral* Artery happens to divide above the Elbow, which is not very uncommon, the Proſpect of Cure is better, and the Pulſe will be ſtronger after the Operation.

CHAP. XXXVII.

Of AMPUTATION.

A Spreading Mortification has been always eſteemed ſo principal a Cauſe for Amputation, that it is a faſhion with Writers to treat of the nature of a Gangrene, previous to the Deſcription of this Operation; and I think they have all agreed, that whatever the Species of it be, if the Remedies they preſcribe, do not prevent its Progreſs, the Limb muſt be amputated: However, this Operation is ſpoken of as frequently unſucceſsful, and in length of time, its want of Succeſs has been ſo unqueſtionably confirmed by repeated Experiments, that ſome of the moſt eminent Practitioners here in *England*, make that

very Circumſtance an Exception to the Operation, which ſo few Years ſince was the great Inducement; and the Maxim now is, never to extirpate 'till the Mortification is abſolutely ſtopped, and even advanced in its Separation.

Gangrenes may be produced two ways; either by Indiſpoſition of Body, or by Accident in a healthful State; for as the Life of a Part depends upon the Circulation of its Fluids, whatever ſhall make the Circulation ceaſe, will inevitably occaſion a Gangrene: Thus a mere Compreſs preventing the Courſe of the Blood, as effectually cauſes a Mortification, as any Indiſpoſition in the Fluids or Veſſels.

It frequently happens in old Age, that the Arteries of the lower Extremities oſſify, which deſtroying their Elaſticity, muſt in conſequence produce a Gangrene in the Toes firſt, and afterwards in the Limb nearly as high as where the Oſſification terminates; ſo that in Mortifications ariſing from this Cauſe, we at once ſee why Amputation, during their Increaſe, is of ſo little Service, unleſs performed above the Oſſification; but we have no way to judge where the Oſſification ends, but by the Inference we make from the Gangrene's ſtopping;

ping: Hence we may learn the Propriety of our modern Practice in this Caſe.

If by any Accident the Limb has been injured to that violent degree as to begin to mortify, it will be no more fit to operate here 'till it ſtops, than in the other Inſtance; becauſe all Parts that are mortified, have had the Diſpoſition to become ſo, before the Effect is produced: and cutting off a Limb, half an Inch above the abſolute dead Skin, is generally leaving a Part behind, with the Seeds of a Mortification in it; ſo, unleſs we can be ſure, the Veſſels are not affected to the Place of Amputation, which will be hard to know but from the Conſequence, the Operation will be uſeleſs.

Sometimes the Fluids of the Body are ſo vitiated, as to loſe their proper nutritious Qualities; and the Limb becomes gangrened, not from any Alteration in its Veſſels, but chiefly from its Situation, which being at a great Diſtance from the Heart, will be more prone to feel the ill Effects of a bad Blood than any other Part, as the Circulation is more languid in the Extremities: and it ſeems not very improbable that in ſome Diſpoſitions of the Blood, a Mortification may alſo be a kind of critical

Diſcharge. When therefore a Gangrene ariſing from either of theſe Cauſes, is running on, Amputation above it, will for the moſt part be uſeleſs ſince it is only removing one Degree of the Effects of the bad Juices, and leaving them in the ſame State to produce the like Miſchief in other Parts: Thus we ſee after Amputations on this account, the Gangrene ſometimes falls on the Bowels, or the other Extremities; from which Obſervation, I think we may conclude it not ſafe to amputate, 'till the Fluids are altered; and this Alteration will preſently diſcover itſelf by the Stopping of the Mortification.

I have laid it down as a Rule, that the Mortification ſhould not only be ſtopped, but advanced in its Separation; the Reaſon of which is, that tho' the Blood is ſo much altered for the better as to occaſion a Stoppage of the Gangrene, yet at this point of Alteration, 'tis ſtill in a bad State, and ſhould be left to mend, with the utmoſt Tranquillity of Body, and Aſſiſtance of Cordial Medicines, 'till ſuch time as Granulations of Fleſh upon the living Part of the Extremity, ſhew the balſamick Diſpoſition of the Blood: In the mean while, to take off the Stench of the Gangrene, it may

may be wrapt up in ſpirituous or odoriferous Applications. I have ſeen ſome Limbs taken off immediately upon the Mortification's ceaſing, when afterwards the Patients have ſunk from frequent Effuſions of Blood, not diſcharged by the great Veſſels, but the whole Stump: Theſe Hæmorrhages I conceive were owing to the Thinneſs of the Blood, which hardly gave a reddiſh Tincture to the Cloths and Bandages; on the other hand, upon waiting a conſiderable Time after the ceaſing of the Mortification, I have taken off ſome myſelf with as good Succeſs, as for any other Diſorder.

Gunſhot Wounds, compound Fractures, and all ſudden Accidents requiring Amputation, are attended with the beſt Succeſs if immediately performed. Diſorders of the Joints, Ulcers of long ſtanding, and all ſcrophulous Tumours, do ſometimes return on other Parts after the Operation. When a Leg is to be amputated, the Manner of doing it is this.

Lay your Patient on a Table two Feet ſix Inches high, which is much better than a low Seat, both for ſecuring him ſteady, and giving yourſelf the Advantage of operating without ſtooping, which is not only pain-

painful, but inconvenient in the other Situation. While one of the Aſſiſtants holds the Leg, you muſt roll a Slip of fine Rag half an Inch broad, three or four Times round it, about four or five Inches below the inferior Extremity of the *Patella:* This being pinned on, is to ſerve as a Guide for the Knife, which without it, perhaps would not be directed ſo dexterouſly: The manner of rolling has always been perpendicular to the Length of the Leg, but having ſometimes obſerved, that tho' the Amputation at firſt be even, yet afterwards the *Gaſtrocnemius* Muſcle contracting, draws back the inferior Part of the Stump more ſtrongly than the other Muſcles can do the reſt of it; I have lately, in order to preſerve the Regularity of the Cicatrix, allowed for this Exceſs of Contraction, and made the circular Inciſion in ſuch a manner that the Part of the Wound which is on the Calf of the Leg is a little farther from the Ham than that on the Shin is from the Middle of the *Patella.*

In the mean time, one of your Aſſiſtants muſt carry a ſtrong Ligature round the Thigh, about three or four Inches above the *Patella,* which paſſing thro' a couple of Slits in a ſquare Piece of Leather, he muſt twiſt

twiſt with a Tourniquet, 'till the Artery is ſufficiently compreſſed, to prevent any great Effuſion of Blood; and to do it more effectually, he may lay a Bolſter of Tow or Linen under the Ligature, upon that Part where the Artery creeps. It will alſo be a little more eaſy to the Patient, to carry a Compreſs of Linen, three or four times double, round the Thigh, on that Part where the Ligature is applied, in order to prevent it from cutting the Skin.

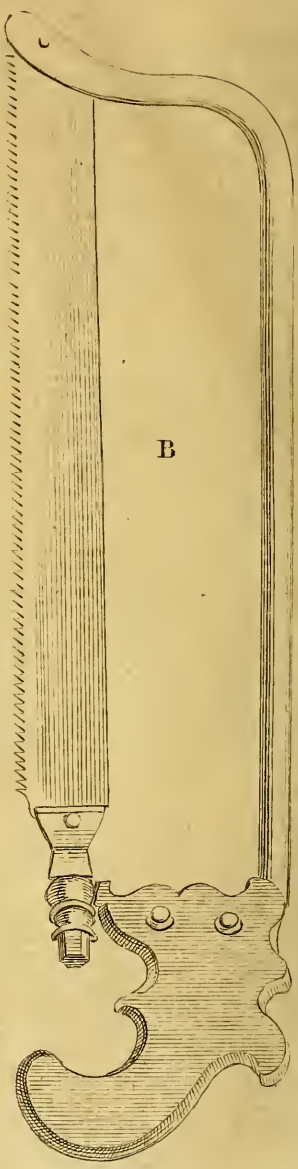
The Courſe of the Blood being ſtopped, you muſt begin your Inciſion juſt below the Linen Roller, on the under Part of the Limb, bringing your Knife towards you, which at one Sweep may cut more than the Semicircle; then beginning your ſecond Wound on the upper Part, it muſt be continued from the one Extremity to the other of the firſt Wound, making them but one Line. Theſe Inciſions muſt be made quite thro' the *Membrana Adipoſa*, as far as the Muſcles; then taking off the Linen Roller, and an Aſſiſtant drawing back the Skin, as far as it will go, you make your Wound from the Edges of it when drawn back, thro' the Fleſh to the Bone, in the ſame manner as you did thro' the Skin. Before you ſaw the Bones, you muſt cut the Ligament

ment between them, with the Point of your Knife, and the Aſſiſtant who holds the Leg while it is ſawing, muſt obſerve not to lift it upwards, which would clog the Inſtrument; and at the ſame time, not to let it drop, leſt the Weight of the Limb ſhould fracture the Bone, before it is quite ſawed thro'.

In amputating below the Knee, it is of Advantage to ſtand on the Inſide of the Leg; becauſe the *Tibia* and *Fibula* lie in a Poſition to be ſawed at the ſame Time, if the Inſtrument be applied externally: Whereas, if we lay it on the Inſide of the Leg, the *Tibia* will be divided firſt, and the *Fibula* afterwards; which not only lengthens the Operation, but it is alſo apt to ſplinter the *Fibula* when it is almoſt ſawed thro', unleſs the Aſſiſtant be very careful in ſupporting it.

When the Leg is taken off, the next Regard is to be had to the ſtopping the Blood, which muſt be effectually done before the Patient is put to Bed, or there will be great Danger of bleeding again, when the Fever is excited, and the Veſſels of the Stump dilated, both which happen a very little while after the Operation. There is no Method for this Purpoſe ſo ſecure, as taking

A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taking up the Extremities of the Veſſels with a Needle and Ligature in the following Manner. As ſoon as the Amputation is performed, the Aſſiſtant muſt looſen the Tourniquet for a Moment, upon which the Orifices of the Arteries will appear by the Iſſue of the Blood. The Operator having then fixed his Eye upon one of the largeſt Veſſels, paſſes a crooked Needle thro' the Fleſh, a little more than a quarter of an Inch above the Orifice, and about the ſame Depth, in ſuch a Direction, as to make nearly one third of a Circle round the Veſſel: then withdrawing the Needle, he a ſecond time paſſes it into the Fleſh and out again, in the ſame Manner and about the ſame Diſtance below the Orifice of the Veſſel: By this means, the Thread will almoſt encompaſs the Veſſel, and when it is tied (which ſhould be done by the Surgeon's Knot) will neceſſarily incloſe it within the Stricture. All the conſiderable Arteries are to be taken up in the ſame manner: that is, the Tourniquet is to be looſened in order to diſcover the Veſſel, and then the Needle is to be paſſed round it as I have here deſcribed. This is a much better Way than uſing the Artery Forceps, where the Veſſels are apt to ſlip away out of

of the Ligature; and as to ſtyptick Applications, their want of Safety is ſo well known now, that the Uſe of them, in Hæmorrhages from large Veſſels, is almoſt univerſally rejected; though it is thought by ſeveral Surgeons who have experienced the Virtue of Agaric, that it will be found to be a more powerful Aſtringent than any hitherto diſcovered.

It ſometimes happens in a large Stump, that ten or more Veſſels require tying, which done, you muſt apply looſe dry Lint to the Wound; or in caſe the ſmall Veſſels bleed plentifully, you may throw a handful of Flour amongſt the Lint, which will contribute to the more effectual ſtopping up their Orifices: Before you lay on the Pledgit, you muſt bind the Stump, and begin to roll from the lower Part of the Thigh down to the Extremity of the Stump. The uſe of this Roller, is to keep the Skin forwards, which, notwithſtanding the Steps already taken to prevent its falling back, would in ſome meaſure do ſo, unleſs ſuſtained in this manner. The Dreſſing may be ſecured by the croſs Cloth and gentle Bandage; and the Method of treating the Wound, may be learnt from what has

has been ſaid, with reſpect to recent inciſed Wounds.

Before the Invention of making the double Inciſion I have juſt now deſcribed, the Cure of a Stump was always a Work of length of Time; for by cutting down to the Bone at once, and ſawing it directly, the conſequence was, that the Skin and Fleſh withdrew themſelves, and left it protruding out of the Wound two or three Inches in ſome Caſes; ſo that it rarely happened, that an Exfoliation did not follow, which beſides being tedious, alſo frequently reduced the Wound to an habitual Ulcer, and at beſt, left a pointed Stump, with a Cicatrix ready to fly open upon the leaſt Accident; all which Inconveniencies are avoided by this new Method; and I know not of any Objection to it, unleſs that the Pain of making the Wound, is ſuppoſed to be twice as much as in the other, becauſe of the double Inciſion; but when we conſider, that we only cut the Skin once, and the Fleſh once, though not in the ſame moment, I fancy upon Reflexion, the difference of Pain will be thought inconſiderable.

It muſt be confeſſed however, that notwithſtanding we derive ſuch Benefits from the

the double Incision, the contractile Disposition of the Muscles, and perhaps of the Skin itself, is so great, that in spite of any Bandage they will retire from the Bone, especially in the Thigh, and sometimes render the Cure tedious.

To remove this Difficulty, I have lately in Amputations of the Thigh made use of the Cross-stitch, which I would advise to be applied in the following manner.

Take a Seton Needle, and thread it with about eight Threads of coarse Silk, so that when they are doubled, the Ligature will consist of sixteen Threads about twelve or fourteen Inches long; wax it pretty much, and range the Threads so that the Ligature may be flat, resembling a Piece of Tape, after which, oil both it, and the Edge of the Needle: The Flatness of the Ligature will prevent its wearing through the Skin so fast as it would do, if it was round, and the Oil will facilitate its Passage: Then carry the Needle through the Skin, at about an Inch from the Edge of the Stump, and out again on the Inside of the Stump; after which it must be passed through the opposite-side of the Stump, from within outward, exactly at the same distance from the Lips of the Wound; this done, the Silk

Silk is to be tied in a Bow-knot. With another Needle and Skain of Silk, the ſame Proceſs is to be repeated, in ſuch manner, that the Ligatures may cut each other at right Angles. If it is a large Thigh, the Lips of the Wound may be made to approach each other ſo nearly, as that the Diameter of the Wound may be about two inches long; but in this, and in all other Stumps, the Approximation of the Lips will depend upon the Laxneſs of the Skin and the Quantity preſerved by an artful double Inciſion; for the Skin muſt not be drawn together ſo tight as to put it upon the Stretch, leſt it ſhould bring on an Inflammation and Pain.

The Manner of applying the Croſs-ſtitch after the Amputation of a Leg has nothing particular in it, only that the Threads muſt be carried between the *Tibia* and *Fibula*, rather than directly over the *Tibia*: and before the Skin is drawn over the End of the Stump, it will be proper to lay a thick Doſſil of Lint on the Edges of the *Tibia*, in order to prevent them from wounding the Skin. The Dreſſings muſt be ſuperficial; and to preſerve the Wound clean, an Injection of Barley Water, or warm Milk, may be thrown in, with a ſmall Syringe,

ringe, between the Stitches, which will prevent any Matter from harbouring there.

I have adviſed the Skains of Silk to be tied with a Bow-knot, that in caſe of a *Hæmorrhage*, they might be undone in order to diſcover the Veſſels more eaſily, and alſo if any Tenſion ſhould enſue, that they might be looſened for three or four Days, and then tied again, when the Suppuration comes on and the Parts are more at liberty.

Perhaps it may be objected that the double Inciſion is of itſelf ſufficient for anſwering the Ends propoſed by this Meaſure; but whoever is converſant in this branch of Practice, muſt know, that notwithſtanding the lax State of the Skin and Muſcles at the Time of the Operation, yet ſome Days after, they fall conſiderably back from the Bone, and in the Thigh particularly ſo much, that no Bandage will ſuſtain them; the Conſequence of which, is a proportionable Largeneſs of Wound, a Tediouſneſs of Cure, and ſome degree of Pointedneſs in the Stump. It may be obſerved too, that the Strictneſs of Bandage employed for ſupporting the Skin and Muſcles of the Thigh, is not only painful, but in all probability may obſtruct the Cure of the Wound

Wound by intercepting the Nutrition; for it is certain, that by long Continuance, it often waſtes the Stump, and I am jealous it may alſo be acceſſary to thoſe Abſceſſes, which ſometimes form amongſt the Muſcles in different parts of the Thigh.

The Queſtion then remaining is, whether theſe Stitches will ſupport the Skin and Muſcles more effectually than Bandage, without producing ſome new Evil, a Point which can only be decided by Experiment. It is true that this very Method was followed by ſome of our Anceſtors, and the Objections to it have abſolutely prevailed over the Arguments in favour of it; for few People now even know it ever was practiſed. Yet I cannot help imagining that Caprice may have had more Share in utterly diſcarding this Method, than Reaſon and Obſervation; for it is poſitively ſaid by ſome of the moſt able and candid Practitioners, to have ſucceeded marvellouſly; and as the Inflammation and Symptomatick Fever, ſuppoſed to be excited by it, were always relievable by cutting or looſening the Stitches, there does not ſeem to have been reaſonable grounds for wholly giving up ſuch great Advantages.

But if the Objections to it were of force, when the ſingle Inciſion was practiſed, they diminiſh exceedingly now that we perform the Operation by the double Inciſion; for though the double Inciſion does not wholly prevent the withdrawing of the Muſcles from the Bone, yet it abates the Degree of it ſo much, that they can ſuffer the Stitches, without incurring either Inflammation or Pain, to which they were much more liable after the ſingle Inciſion. It muſt be remarked however, that they draw with that Strength as to make the Stitches wear thro' the Skin and Fleſh in twelve or fourteen Days; but this is done ſo gradually, that it cauſes very little Pain or Inflammation, and tho' they conſequently come off with the Dreſſings, yet by this Time the Skin and Muſcles are fixed; and a ſlight Bandage will be ſufficient to maintain them in the ſame Poſition.

The two greateſt Objections I know of, to this Method, are, the Deformity of the Stumps, and the additional Pain of the Operation: but as a Stump is not expoſed to View, after the Cure, its want of Beauty is of no great Conſequence: and though it muſt be granted that the Stitches cannot be

be made without ſome Pain, perhaps it will not be found ſo bad as one is apt at firſt to ſuggeſt; for the mere paſſing of a large Needle through the Fleſh without making a *Stricture*, is very bearable in compariſon of a tight Ligature: but whatever be the Increaſe of Pain for the preſent, the future Eaſe in conſequence of it, is an ample Compenſation, and, if I am not miſtaken, there is ſtill another Conſideration of a much higher Importance than any I have mentioned, I mean a leſs hazard of Life.

For the Symptomatick Fever, and the great danger of Life attendant upon an Amputation, do not ſeem to proceed purely from the Violence done to Nature by the Pain of the Operation, and the removal of the Limb; but alſo from the Difficulties with which large Suppurations are produced: and this is evident, from what we ſee in very large Wounds that are ſo circumſtanced as to admit of healing by Inoſculation, or as Surgeons expreſs it, by the firſt Intention; for in this Caſe, we perceive the Cure to be effected without any great Commotion, whereas the ſame Wound, had it been left to ſuppurate, would have occaſioned a Symptomatick Fe-

ver, *&c.* but in both Inſtances, the Violence done by the mere Operation is the ſame, whether the Wound be ſewed up, or left to digeſt.

Upon this Principle, we may account for the diminution of Danger, by following the Method here propoſed; becauſe as the Stitches have a power of holding up the Fleſh and Skin over the Extremity of the Stump, till they adhere to each other in that Situation; they actually do by this means leſſen the Surface of the Wound; in conſequence of that, the Suppuration; and in conſequence of both, the Danger reſulting from the Suppuration.

In Amputating the Thigh, the firſt Inciſion is to be made a little more than two Inches above the middle of the *Patella*; after the Operation, a Roller ſhould be carried round the Body, and down the Thigh, to ſupport the Skin and Fleſh; this is alſo the moſt proper Bandage, as Abſceſſes will ſometimes form in the upper part of the Thigh, which cannot diſcharge themſelves ſo conveniently with any other, it being almoſt impracticable to roll above the Abſceſs, unleſs we begin from the Body.

The Amputation of the Arm or Cubit differs ſo little from the foregoing Operations,

tions, that it will be but a Repetition to deſcribe it. However, it muſt be laid down as a Rule, to preſerve as much of the Limb as poſſible, and in all Amputations of the upper Limbs, to place your Patient in a Chair.

There are in the Armies a great many Inſtances of Gun-ſhot Wounds of the Arm near the *Scapula*, which require Amputation at the Shoulder; but the Apprehenſion of looſing their Patients on the Spot by the Hæmorrhage, has deterred Surgeons from undertaking it. I have known where it has been done more than once with Succeſs; but though it had never been performed, we might learn it is practicable, from the Caſe of a poor Miller, whoſe Arm and *Scapula* were both torn from his Body, by a Rope which was accidentally twiſted round his Wriſt, and ſuddenly drawn up by the Mill. Almoſt every one in *London* knows the Story, and that he recovered in a few Weeks: It is very remarkable in this Accident, that after Fainting, the Hæmorrhage ſtopped of itſelf, and never bled afreſh, though nothing but Lint and Turpentine were laid on the great Veſſels. In caſe therefore of a Wound or Fracture near the Joint, or incurable Fiſtulas in the

Joint, not attended with much Caries, I think the Operation may be performed ſafely in this manner.

The Patient being laid on his Back, with his Shoulder over the Edge of the Table, make an Inciſion through the *Membrana Adipoſa*, from the Shoulder acroſs the Pectoral Muſcle, down to the Armpit; and in order to ſave as much Skin as poſſible, begin it about two Inches below the Joint; then turning the Knife with its Edge upwards, divide that Muſcle, and part of the *Deltoid*, all which may be done without danger of wounding the great Veſſels, which will become expoſed by theſe Openings; if they be not, cut ſtill more of the *Deltoid* Muſcle, and carry the Arm backward: Then with a ſtrong Ligature, having tied the Artery and Vein, carefully divide thoſe Veſſels at a conſiderable diſtance below the Ligature, and purſue the circular Inciſion through the Joint, cutting firſt into that Part of the Burſal Ligament which is neareſt to the *Axilla*: for if you attempt to make way into the Joint, on the upper part of the Shoulder, the Projection of the *Proceſſus Acromion* and *Proceſſus Coracoides*, will very much embarraſs, if not baffle the Operation. After the Amputation,

putation, the Croſs-ſtitch may be practiſed here with great Benefit,

The Amputation of the Fingers and Toes is better performed in their Articulation, than by any of the other Methods: For this purpoſe, a ſtraight Knife muſt be uſed, and the Inciſion of the Skin be made not exactly upon the Joint, but a little towards the Extremity of the Fingers, that more of it may be preſerved for the eaſier healing afterwards; it will alſo facilitate the Separation in the Joint, when you cut the Finger from the *Metacarpal* Bone, to make two ſmall longitudinal Inciſions on each ſide of it firſt. In theſe Amputations, there is generally a Veſſel or two, that require tying, and which often prove troubleſome when the Ligature is omitted.

It may happen that the Bones of the Toes, and part only of the *Metatarſal* Bones are carious, in which Caſe, the Leg need not be cut off, but only ſo much of the Foot as is diſordered; a ſmall Spring-Saw is better to divide with here, than a large one: When this Operation is performed, the Heel and Remainder of the Foot, will be of great Service, and the Wound heal up ſafely, as I have found by Experience.

PLATE

PLATE XIV.

The EXPLANATION.

A. The Figure of the Amputating Knife. The Length of the Blade and Handle ſhould be about thirteen Inches.

B. The Figure of the Saw uſed in amputating the Limbs. The Length of the Handle and Saw ſhould be about ſeventeen Inches.

CHAP. XXXVIII.

Of INOCULATION.

IT is uſual to prepare the Patient for this Operation, by Diet and Evacuations, which according to the Habit of Body, are to be more or leſs ſevere. Some Phyſicians recommend frequent Bleedings and Purgings, with a ſtrict Milk Diet, the preceding two Months; others a Regimen of mercurial Alteratives, with gentle Purges at proper Intervals, for the ſame length of Time; but, I think, thoſe of the greateſt Eminence in *London*, ſeldom preſcribe Bleeding more than once, and frequently not at all, truſting to an abſtemious Courſe of Life, and

and two or three gentle Purges, and ſometimes to one only, the Week before the Operation, at leaſt, where the Subject is young.

The proper Time for Inoculation, is generally ſuppoſed to be Infancy; and ſome think the earlier, the better; but as Children, the firſt two or three Years of their Life, are ſubject to many terrible Diſorders from the Circumſtance of breeding their Teeth, and indeed ſeem more liable to fatal Convulſions upon the Eruption of the Small-Pox, than after that Time, I believe it is adviſeable to poſtpone the Operation 'till they are three or four Years old when probably, the longer it is deferred, ſo much the worſe; though the Succeſs of this Practice has been ſurpriſing, even in the moſt advanced Age.

Phyſicians have not unanimouſly determined which is the preferable Part for Inoculation, the Arms or Legs; and ſome order the Operation to be performed in one of each: In either Caſe, it is right to do it in two Places; though probably it will not be abſolutely neceſſary; but as one of the Applications may by Accident fall off, or ſlip on one Side from the Orifice, the other will generally take effect, and prevent a Diſap-

Diſappointment. The Practice of Inoculating in the Legs is preferred to the other Method by ſome, from an Obſervation that the Inciſions in theſe Parts, are more diſpoſed to ulcerate and yield a greater Diſcharge, than thoſe in the Arms, which Circumſtance they imagine to be advantageous, upon a Perſuaſion it makes a powerful Revulſion of the morbid Matter from the Face and Throat: On the contrary, the Advocates for Inoculating in the Arms, adviſe it for the very Reaſon, that the Orifices are leſs liable to become ſore and painful; alledging, that the Diſcharge from the Wounds cannot be favourable to the Eruption, ſince it ſeldom happens 'till the Puſtules appear, and are even ripe; or ſhould it be judged neceſſary from the Nature of the Diſtemper, or the Patient's Conſtitution, to continue the Diſcharge, ſtill it may be done as efficaciouſly in the Arms, by converting one or both Inciſions into an Iſſue. Theſe Conſiderations have induced the Generality of Phyſicians to approve of this laſt Method.

The Operation is to be performed after this manner. You muſt with a Stocking Needle prick five or ſix large Puſtules on the Arm or Leg of the Subject you inoculate

late from, when they are plumpeſt, and the Diſtemper is at its Height; then taking a few Threads of Lint, roll them up ſo as to make one Thread of the Thickneſs of fine Worſted: draw this over the Orifices made into the Puſtules, 'till a ſufficient Quantity of it is moiſtened by the Matter iſſuing out of them. Cut this Thread into Pieces of the Length of a Barley-Corn, and put them immediately into a little Box or Bottle, which ſhould be ſhut up cloſe; and tho' perhaps the Matter may retain its Efficacy for many Hours or Days, yet it is adviſeable to uſe it as ſoon as poſſible. It would be of no Importance, what Part of the Arms or Legs were to receive the Infection, but that a Drain may be deſireable after the Illneſs; and therefore the Inciſions ſhould be in thoſe Places, where Iſſues are generally ordered, that by putting in a Pea, you may at pleaſure procure a Diſcharge from them, as long as you ſhall think proper, a Month, two Months, or more: The Orifices ſhould be cut with a Lancet, the length of a Barley-corn, and ſo ſhallow, as barely to fetch Blood; the Pieces of Lint muſt be laid exactly on them, and ſecured in their Situation by a ſticking Plaiſter and Bandage; this Application ſhould

ſhould remain twenty-four or thirty-ſix Hours, and afterwards, the Orifices may be treated every Day with Digeſtives or other Medicines, according to their Degree of Inflammation, Ulceration and Pain. After the Operation, the Patient muſt be confined, and live low till the time of the Eruption, which is uſually about the eighth or ninth Day, when the Diſtemper is to be managed as in the ordinary Method.

It is imagined by ſome, that the Matter from an inoculated Subject, is leſs malignant than from a Perſon who has the Diſtemper, however mildly, in a natural Way; but, I think, there is not a ſufficient Foundation for this Opinion: It is without doubt proper to take it from a kind ſort of a healthy Subject; and though it is not probable any other conſtitutional Illneſs will be communicated with the Small-Pox by Inoculation, rather than by the natural Way, which nobody even ſuggeſts; yet as we may have choice of Patients to borrow it from, we ſhould not run any riſk, but fix on ſuch if poſſible, who are under nine or ten Years of Age, and whoſe Parents have always been healthy as well as themſelves.

It

It may not be amiſs to obſerve, that upon the Introduction of the Practice of Inoculation into *England*, amongſt the many popular Prejudices which prevailed againſt it, there was none of ſuch ſeeming Weight, as the Opinion that it did not abſolutely ſecure the Patient from contracting the Diſtemper again in the natural Way; but length of Years, and a ſtrict Enquiry, have at laſt intirely falſified this Doctrine, amongſt Men of Learning and Candour. Great Improvements have been made in *England* ſince the Publication of the foregoing Chapter, both in the Method of Inoculating, and the Manner of treating the Diſtemper; but as they are deſcribed with great Preciſion by Baron *Dimſdale*, I ſhall refer the Reader to his Pamphlet on this Subject.

FINIS.

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